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THE RH FACTOR AND BLOOD GROUP FREQUENCIES IN JAPANESE.[1]

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WE have recently endeavoured to fill as many gaps as possible in our knowledge of blood group data in relation to anthropology for different races in the Pacific. The work performed has been found to be of considerable interest, and we have been encouraged to continue our investigations as opportunity has permitted.

We have examined for the blood groups, the sub-groups of A, the M, N types and the Rh factor, blood specimens from Australian aborigines, Indonesians, Papuans, Fijians and Maoris; some reports (Simmons *et alii* 1944, Wilson *et alii* 1944) have already been published, some are in the press (Simmons *et alii*) and others (Graydon *et alii*) are being prepared for publication.

The purpose of this paper is to report our findings on blood samples obtained from Japanese. Their blood group and M, N type frequencies are already well known as the result of extensive investigations in different districts and cities of the Japanese Empire. The results of these surveys have been tabulated by Boyd in his "Blood Groups" (*Tabulæ Biologicæ*, 1939, pages 174 to 180 and 233 to 234). We have seen no reports, however, of any examination made for the sub-groups of A or for the Rh factor,[2] and it is in the determination of the incidence of these factors that our chief interest lies with regard to the Japanese race.

[1] Submitted for publication, December 22, 1944.

[2] Since submitting this paper for publication we have seen a paper by R. K. Walker and P. Levine, "On Rh and Other Blood Factors in Japanese", *Science*, November 17, 1944, page 453.

The following quotation from "The Encyclopædia Britannica" (1937) gives a brief outline of the origin of the inhabitants of the Japanese islands:

> The best authorities are agreed that the Japanese people do not differ physically from their Korean and Chinese neighbours as much as the inhabitants of northern Europe differ from those of southern Europe. The late Dr. E. Baelz (Emeritus Professor of Medicine in the Imperial University of Tokyo), who made an exhaustive anthropological study of the Japanese, divides the race inhabiting the Japanese islands into three distinct types: (*a*) Manchu-Korean, (*b*) Mongol, and (*c*) Malay or Indonesian.
>
> The first is more common among the upper classes, and its characteristics are exceptional tallness combined with slenderness, a face somewhat long and having more or less oblique eyes, an aquiline nose, a slightly receding chin and delicately shaped hands. The most plausible hypothesis is that men of this type are descendants of Korean colonists who, in prehistoric times, settled in the province of Izumo, on the west coast of Japan, having made their way thither from the Korean peninsula by the Island of Oki. The second type is the Mongol. It is not very frequently found in Japan, perhaps because, under favourable social conditions, it tends to pass into the Manchu-Korean type. There is no satisfactory theory as to the route by which the Mongols reached Japan, but it is scarcely possible to doubt that they found their way thither at one time. More important than either of these types as an element of the Japanese nation is the Malay or Indonesian. This type is found in nearly all the islands along the east coast of the Asiatic continent as well as in southern China and in the extreme south-west of the Korean peninsula. Carried northward by the warm current known as the Kuro Shiwo, this type seems to have landed in Kyushu—the most southerly of the main Japanese islands—whence it ultimately pushed northward and conquered its Manchu-Korean predecessors, the Izumo colonists. None of the above three, however, can be regarded as the earliest settlers in Japan. Before them all was a tribe of immigrants who appear to have crossed from north-eastern Asia at an epoch when the sea had not yet dug broad channels between the continent and the adjacent islands. These people—the Ainu—are usually spoken of as the aborigines of Japan.

They once occupied the whole country, but were gradually driven northward by the Manchu-Koreans and the Malays or Indonesians, until only a mere handful of them survived in the northern island of Yezo. Like the second and third types, they are short and thickly built, but unlike either they have prominent brows, bushy locks, round deep-set eyes, long divergent lashes, straight noses, and much hair on the face and body. In short, the Ainu suggest much closer affinity with Europeans than does any other of the types that go to make up the population of Japan. It is not to be supposed, however, that these traces of different elements indicate any lack of homogeneity in the Japanese race. Amalgamation has been completely effected in the course of long centuries, and even the Ainu, though the small surviving remnant of them now live apart, have left distinct traces upon their conquerors.

Materials and Methods.

The blood samples were obtained from 400 adult male Japanese by our collaborators. The specimens consisted of two drops of blood added to one millilitre of the glucose-citrate solution of Rous and Turner, to which had been added "Merthiolate" to give a concentration of 1 in 100,000. The specimens were taken into rubber-stoppered vials, stored on ice and returned to us in "Thermos" flasks packed in ice. The examinations were made within forty-eight hours of collection and all specimens were received in perfect condition. We have recently found that a number of sterile blood samples taken this way in the laboratory and stored at 38° F. have shown no hæmolysis after eight months' storage and have given specific group, type and Rh agglutination reactions.

All examinations were made by the slide technique as previously described (Simmons *et alii*, 1941, 1943). The grouping sera had been carefully selected, the M, N testing fluids, although prepared some considerable time ago, were still highly potent, and the human anti-Rh sera used were selected and highly potent. The human anti-Rh serum used for the preliminary tests in this survey was a standard anti-Rh_0 serum of group AB, which, on being mixed with equal parts of 4% cell suspensions of different Rh sub-types, gave a complete agglutination on slides at a dilution of 1 in 32. This anti-Rh serum in the present tests was used at a preliminary dilution of 1 in 10, and readings were made after thirty minutes at 37° C. All slides were kept in moist chambers.

We are indebted to Dr. Rachel Jakobowicz for finding this anti-Rh serum and also for others in our collection. It is interesting to note that, to date, only two overseas workers report finding anti-Rh serum suitable for use on slides, while in Australia the slide technique is used in many laboratories. Of the samples of anti-Rh serum sent to us by the Red Cross Blood Transfusion Service and other laboratories for testing and distribution, more than 20 give satisfactory slide agglutination, and with several the agglutination is approximately as strong as that obtained with selected specimens of blood grouping serum. In the present instance it was found possible to perform over 400 preliminary tests for Rh agglutination with only one millilitre of a very potent anti-Rh serum, used at a dilution of 1 in 10. The non-reactors to this serum were then retested with other specimens of anti-Rho' (anti-Rh, Rh_1) serum to check for rare sub-types of Rh which failed to agglutinate with standard anti-Rh_0 serum.

Results.

The blood group frequencies in our series, subdivided according to the island of origin, are shown in Table I; they correspond closely with the results obtained in previously reported surveys. Two of the largest groups compiled by Boyd (1939) are used for comparison in Table II, which also gives the frequencies of the genes for various

TABLE I.

Blood Group Frequencies in Japanese.

Island of Origin.	Number Tested.	Number and Percentage of Groups.				Frequency of Genes.[1]			D/σ_D.
		O.	A.	B.	AB.	*p*.	*q*.	*r*.	
Honshu	272	83 (30·5%)	99 (36·4%)	63 (23·2%)	27 (9·9%)	0·267	0·182	0·552	0·08
Kyushu	59	13 (22·0%)	26 (44·1%)	11 (18·6%)	9 (15·3%)	0·363	0·187	0·469	0·57
Shikoku	48	17 (35·4%)	17 (35·4%)	10 (20·8%)	4 (8·3%)	0·250	0·159	0·595	0·16
Miscellaneous	21	10 (47·6%)	7 (33·3%)	4 (19·0%)	0 (—)	0·184	0·101	0·690	0·42
Total	400	123 (30·75%)	149 (37·25%)	88 (22·0%)	40 (10·0%)	0·274	0·175	0·555	0·36

[1] The gene frequencies were derived from the equations:

$$p = 1 - \sqrt{\frac{O + B}{100}}, \quad q = 1 - \sqrt{\frac{O + A}{100}}, \quad r = \sqrt{\frac{O}{100}}$$

$$D = 1 - (p + q + r).$$

$$\sigma_D = \sqrt{\frac{pq}{2V(1-p)(1-q)}},$$ where V is the total number of individuals in each sample.

TABLE II.

Frequencies of the Genes p, q and r in Japanese and Neighbouring Races.

Race.	Number Tested.	Authority.	Frequency of Genes.		
			p	*q*	*r*
Japanese	400	This survey	0·274	0·175	0·555
Japanese	29,705	Boyd, 1939	0·263	0·174	0·562
Japanese	29,799	Boyd, 1939	0·279	0·172	0·549
Ainu	249	Boyd, 1939	0·299	0·335	0·341
Koreans	311	Boyd, 1939	0·253	0·253	0·523
Chinese	2,127	Boyd, 1939	0·220	0·201	0·587
Manchu	236	Boyd, 1939	0·198	0·249	0·556
Formosans	235	Boyd, 1939	0·197	0·172	0·605
Indo-Chinese	397	Boyd, 1939	0·148	0·187	0·654
Filipinos	501	Boyd, 1939	0·156	0·333	0·507
Indonesians	296	Simmons *et alii*, 1945	0·146	0·138	0·719

other races of the western Pacific area. The frequency of *p*, the gene for the A factor, is higher in the Japanese than in any of the neighbouring races. The aboriginal inhabitants of Japan, the Ainu, who have, perhaps, a higher value for *p*, may have contributed in this respect, but they also possess a much higher value for *q* than the Japanese.

A fairly extensive Indonesian admixture over many centuries with the earlier Manchu-Korean-Ainu complex is a likely explanation of the relatively low value of *q*.

In our series there were 149 individuals of blood group A and 40 of blood group AB. The blood of all these, with the exception of two, was of groups A_1 and A_1B. The two exceptions, who originated in the west of the island of Honshu, were both found to belong to blood group A_2B. On reexamination of these men by Captain Kraft, of the United States Army, no evidence of recent admixture could be discovered. The Japanese in this respect are therefore similar to the Australian aborigines, Hawaiians, American Indians, Eskimos, Chinese and Indonesians, in that the factor A_2 is absent or extremely rare.

The M, N type frequencies found in the present survey (see Table III) do not differ significantly from those previously reported for the Japanese, Chinese and Indonesians.

There is a suggestion that the frequency of *m* may be lower on the islands of Kyushu and Shikoku than on the main island of Honshu, but a larger series would be necessary to establish a difference. The Japanese, in respect of the M, N types, fall into a large world-wide group of races possessing much the same frequencies. Very few races fall outside this group, amongst them being the Australian aborigines, Fijians and American Indians, all of whom have suffered comparatively long periods of isolation from the more densely populated areas of the world.

In tests for the Rh factor 398 blood samples were agglutinated by a standard anti-Rh_0 human serum of group AB, and one sample, which was not agglutinated by this serum, was agglutinated by two specimens of anti-Rho′ serum and was therefore Rh-positive of sub-type Rh′. Only one sample was found to be Rh-negative with all test antisera.

The Japanese in respect of the Rh factor, therefore, give a result similar to the Australian aborigines, American Indians, Chinese and Indonesians, the blood of all of which races is approximately 100% Rh-positive. In the white races tested, only 85% approximately have Rh-positive blood. Certain individuals in the white race whose blood is Rh-negative are liable to have blood transfusion reactions following repeated transfusions of Rh-positive blood of the appropriate group, and hæmolytic disease of the new-born may occur as a result of Rh-immunization by a fœtus with Rh-positive blood in a mother with Rh-negative blood. Similar cases should therefore not occur or should be extremely rare in Japanese individuals, and it will be interesting to hear later if such cases due to the Rh factor have been reported in Japan.

Summary.

Blood samples from 400 Japanese have been tested for blood groups, sub-groups, M, N types and the Rh factor. Of the samples, 123 (30·75%) belonged to group O, 149 (37·25%) to group A, 88 (22·0%) to group B, and 40 (10·0%) to group AB. Only two (1·1%) of 189 samples of blood of groups A and AB were of sub-group A_2.

One hundred and fourteen (28·5%) of the samples were of type M, 204 (51%) were of type MN, and 82 (20·5%) were of type N.

Three hundred and ninety-nine (99·75%) of the samples were Rh-positive; only one sample was found to be Rh-negative with all specimens of human anti-Rh test serum used.

TABLE III.

M, N Frequencies in Japanese.

Island of Origin.	Number Tested.	Number and Percentage of Types.			Frequency of Genes.[1]		D/σ_D.
		M.	MN.	N.	*m*.	*n*.	
Honshu	272	84 (30·9%)	136 (50·0%)	52 (19·1%)	0·559	0·441	0·23
Kyushu	59	11 (18·6%)	34 (57·6%)	14 (23·7%)	0·475	0·525	1·2
Shikoku	48	9 (18·8%)	28 (58·3%)	11 (22·9%))	0·479	0·521	1·2
Miscellaneous	21	10 (47·6%)	6 (28·6%)	5 (23·8%)	0·619	0·381	1·6
Total	400	114 (28·5%)	204 (51·0%)	82 (20·5%)	0·540	0·46	0·54

[1] The gene frequencies were calculated from the relations $m = \frac{2M + MN}{2V}$, $n = \frac{2N + MN}{2V}$, $D = 1 - \left(\sqrt{\frac{M}{V}} + \sqrt{\frac{N}{V}}\right)$, $\sigma_D = \frac{1}{2\sqrt{V}}$, where V = number tested.

TABLE IV.

M, N Frequencies in Various Races.

Race.	Number Tested.	Authority.	Frequency of Genes.	
			m	*n*
Japanese	400	This survey	0·54	0·46
Japanese (Honshu)	2,000	Hirasama, *after* Boyd, 1939	0·546	0·441
Japanese (Honshu)	2,857	Arai, *after* Boyd, 1939	0·535	0·469
Japanese (Kyushu)	3,334	Taniguchi, *after* Boyd, 1939	0·519	0·488
Chinese	1,029	Ride, *after* Boyd, 1939	0·576	0·427
Chinese	138	Wiener (1944)	0·551	0·449
Indonesians	296	Simmons *et alii*. (1945)	0·532	0·468
White Australians	1,000	Simmons *et alii* (1941)	0·545	0·455
Germans	8,144	Schiff, *after* Boyd, 1939	0·545	0·443
Italian	300	Nicoletti, *after* Boyd, 1939	0·566	0·447
American Indians	140	Allen and Larsen, *after* Boyd, 1939	0·770	0·281
Ainu	504	Kubo, *after* Boyd, 1939	0·423	0·564
Australian aborigines	649	Wilson *et alii* (1944)	0·297	0·703
Fijians	200	Simmons *et alii*. (In the press)	0·332	0·667

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We wish to thank Captain Kraft, of the United States Army, Mr. E. F. Woods, B.Sc., and Miss L. Murray, of the Commonwealth Serum Laboratories, and the Department of Information for their cooperation in this survey.

Bibliography.

W. C. Boyd: "Blood Groups", *Tabulæ Biologicæ*, Volume XVII, 1939; "Encyclopædia Britannica", Volume XII, 1937.

R. T. Simmons, Lucy M. Bryce, J. J. Graydon and Harold Wilson: "A Note on the Preparation and Use of M and N Testing Fluids", THE MEDICAL JOURNAL OF AUSTRALIA, October 25, 1941, page 474; "The Blood Groups of Australian Aborigines", *ibidem*, December 2, 1944, page 581.

R. T. Simmons, J. J. Graydon, Rachel Jakobowicz and Lucy M. Bryce: "The Rh Factor: Its Incidence in a Series of Victorian Red Cross Donors", THE MEDICAL JOURNAL OF AUSTRALIA, December 18, 1943, page 496.

R. T. Simmons *et alii*: "The Rh Factor: Ethnological Aspects", THE MEDICAL JOURNAL OF AUSTRALIA, May 27, 1944, page 483.

R. T. Simmons, J. J. Graydon and Patricia Hamilton: "The Rh Factor in the Blood of Australian Aborigines", THE MEDICAL JOURNAL OF AUSTRALIA, June 27, 1944, page 553.

R. T. Simmons, J. J. Graydon and C. Ouwehand: "Blood Groups, M, N Types and the Rh Factor in Indonesians", THE MEDICAL JOURNAL OF AUSTRALIA, February 3, 1945, page 108.

R. T. Simmons, J. J. Graydon and Godfrey Barnes: "Blood Groups, Sub-Groups, M, N Types and the Rh Factor in Fijians", THE MEDICAL JOURNAL OF AUSTRALIA, in the press.

A. S. Wiener, E. B. Sonn and Chien L. Yi: "Blood Groups, Sub-Groups, M, N and Rh Types of Chinese", *The American Journal of Physical Anthropology*, Volume II, September, 1944, page 267.

ADELAIDE LOCAL BOARD OF HEALTH SURVEY OF SCHOOL CHILDREN BY MANTOUX AND PATCH TEST.

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No tuberculosis survey of healthy school children by skin-testing methods has been carried out hitherto, so far as is known, in Australia. The validity of the use of the patch test for such a survey has been disputed. Colebatch has found that the material for the tuberculin patch tests put up by the Commonwealth Serum Laboratories gives, for children in hospital, results which are comparable closely with those of the Mantoux intracutaneous injection of tuberculin in a strength of 1/1,000. The application of patches to children roaming at large and tested under mass survey conditions involves factors that do not apply to children in hospital.

The Adelaide Local Board of Health, therefore, last year decided to carry out a skin test survey of about a thousand children. The State Director of Education gave permission for the survey to be conducted in the State schools under conditions similar to those governing immunization against diphtheria. Printed forms were distributed during the first term of the year to parents of school children, and those who were willing signed and returned the forms, giving permission for their children to be tested. Schools in the city of Adelaide were approached in the first instance, but responses were far below the number required. Circulars were therefore sent to a series of schools in the southern suburbs, and more than the expected number of volunteers was obtained. Later more applications were received from city schools, so that it was finally possible to complete the testing of 1,409 children and 16 teachers. The survey was begun in June and ended in August, the coldest months of the year.

An index card was prepared for each child. Patches for the test were supplied by the Commonwealth Serum Laboratories at generous rates. Fresh dilutions of old tuberculin (1/1,000 and 1/100) together with control diluent solution were supplied each week by the Institute of Medical and Veterinary Science. These dilutions of tuberculin were tested for potency by the institute. Patches and tuberculin solutions were kept in a refrigerator, and no tuberculin solution was used after fourteen days from the date of preparation of the dilution.

The working team consisted of four members of the staff of the Health Department, and variable groups of three "V.A.D.'s" from sections which have given long and valuable assistance in diphtheria immunization.

Syringes and needles were sterilized by boiling in an electrical sterilizer. Table coverings, dishes, bowls and swabs were autoclaved in a large steam kettle. Special care was taken to wash out needles thoroughly after use.

The full team attended at one of the schools on Wednesdays and Fridays, and only a small group attended to make the final readings on Mondays. This allocation of days was necessary, as only a limited time was available on Mondays, and the final readings could be managed on that day, but not the more time-consuming injections.

At the sessions on Wednesdays, the index card was distributed to each child, and the children filed into the testing room one by one. A "V.A.D." swabbed the inner side of the upper part of the arm and the front of the forearm of the child vigorously with ether. Intracutaneous injections of tuberculin (1/1,000) and of control solution were then made by myself. One "V.A.D." was responsible for needles and syringe for the tuberculin, and another for syringe and needles for the control solution. The tuberculin injections were always made high on the forearm, and the control lower. Confusion of injections was thus avoided. The child then passed on to another table, where the city health nurse applied a patch longitudinally on the upper part of the inner surface of the arm previously cleansed with ether. Patches were removed from their envelopes just before use, and warmed on a plate over a bowl of hot water. The child's card was then collected and a printed slip was given, asking the parent not to disturb the patch nor allow it to be wetted. Cards were then stamped with dates against recordings of injections and patch applications.

At the sessions on Fridays the cards were distributed as before. As each child entered the room a "V.A.D." removed the patch. If the patch had been lost or become loose, a fresh patch was applied by the health nurse on the other arm. Only one child in the group which reacted to the Mantoux test lost his patch, and this second patch gave a positive result. The result of the Mantoux test was read by myself and recorded by an assistant. If it was negative or only slightly positive, an intracutaneous injection of tuberculin (1/100 dilution) was made on the forearm between the two previous injections. During the latter two-thirds of the survey a second patch was applied to the other arm of every child showing any sign of positive reaction to the Mantoux test with 1/1,000 dilution, and the child was given a typed slip asking the parent to remove the patch at midday on Sunday. The patch site was also inspected by myself, but there was rarely any sign of reaction to record at the time. Cards were collected and the date was stamped against recordings.

At the sessions on Mondays, cards were distributed again. The results of the Mantoux test (1/1,000 and 1/100 dilution) and of the patches were read by myself and recorded by an assistant, the cards were collected and the date was stamped against the records and other comments.

There were usually a few absentees from the Friday and Monday sessions. These children were visited at their homes if possible, and appropriate injections, patch applications and records were made. The number of children whose tests were not completed was unexpectedly and gratifyingly small.

Twelve schools were included in the survey. One school was attended twice owing to a wave of enthusiasm arising after the first visits. The groups of children tested varied in number from 50 to 220 at the different schools.

Some misgivings were felt from the outset of the survey concerning the reading of the patch test results five days after application of the patch and three days after its removal. Some of the children were therefore inspected both earlier and later. Also second patches were applied to a few children and the results were inspected on both the first and third days after removal. At this stage the following results had been observed. (i) Of six children showing positive patch test reactions when the patch was removed on the second day, two showed equal reactions

and four stronger reactions on the fifth day. (ii) Of two children showing positive patch test reactions on the third day, one showed equal and one stronger reactions on the fifth day. (iii) Of four children showing negative results to the patch test on the third day, all gave negative results on the fifth day.

The practice was then adopted of applying a second patch on the Friday sessions to all positive reactors. By this means patch test results one and three days after removal of the patch were read simultaneously on the Monday. The second patch also supplied some evidence concerning the experimental error involved in applying the patches.

The patches supplied by the Commonwealth Serum Laboratories have each two disks of filter paper saturated with tuberculin. The intensity of the positive reactions to the Mantoux injections and to each disk of the patch tests was recorded according to the grades adopted by Colebatch. This classification recognizes five grades of intensity ranging from "±" to "++++". The "±" reactions are not admitted as positive reactions by all authorities. The "±" Mantoux reaction is defined by Colebatch as "erythema and a trace of œdema, less than 5 millimetres in diameter". Five positive readings to the Mantoux test (1/1,000) were recorded in this grade, the reactors being two boys and three girls, of whom only one, a boy, reacted to the patch test; all were confirmed by positive reactions of higher grades to the Mantoux test with 1/100 dilution. Nine reactors (four boys, five girls) to the Mantoux test with 1/100 dilution were recorded in the "±" grade. Not

TABLE I.

Comparison of Results of Mantoux Test and Patch Test.

Age. (Years.)	Sex.	Number in Group.	1/1,000 Dilution.			1/100 Dilution. (Negative results with 1/1,000 Dilution.)		
			Positive Response to Mantoux Test.	Positive Response to Patch Test.	Negative Response to Patch Test.	Positive Response to Mantoux Test.	Positive Response to Patch Test.	Negative Response to Patch Test.
3	M.	1	—	—	—	—	—	—
	F.	—	—	—	—	—	—	—
4	M.	3	—	—	—	—	—	—
	F.	3	—	—	—	1	0	1
5	M.	28	—	—	—	1	0	1
	F.	29	2	2	0	—	—	—
6	M.	49	1	1	0	—	—	—
	F.	49	1	1	0	—	—	—
7	M.	63	1	1	0	1	0	1
	F.	61	3	3	0	1	0	1
8	M.	42	2	1	1	—	—	—
	F.	50	3	3	0	—	—	—
9	M.	40	1	1	0	1	0	1
	F.	49	3	3	0	1	0	1
10	M.	61	6	5	1	—	—	—
	F.	61	4	4	0	2	0	2
11	M.	65	8	7	1	1	0	1
	F.	85	8	6	2	—	—	—
12	M.	104	9	8	1	—	—	—
	F.	119	6	4	2	4	1	3
13	M.	114	15	15	0	3	0	3
	F.	133	13	8	5	1	0	1
14	M.	59	6	6	0	—	—	—
	F.	94	8	6	2	1	0	1
15	M.	11	1	1	0	—	—	—
	F.	30	1	0	1	—	—	—
16	M.	—	—	—	—	—	—	—
	F.	6	1	0	1	—	—	—
Total ..	M.	640	50	46	4	7	0	7
	F.	769	53	40	13	11	1	10
Grand total ..		1,409	103	86	17	18	1	17

TABLE II.

Groups. (Years.)	Sex.	Number in Group.	Dilution of 1/1,000.				Dilution of 1/100. (Negative results with 1/1,000.)		Reacting to Mantoux Test.		Reacting to Patch Test.	
			Reacting to Mantoux Test.		Reacting to Patch Test.		Number Reacting to Mantoux Test.	Number Reacting to Patch Test.	Total Number.	Percentage of Group.	Total Number.	Percentage of Group.
			Number.	Percentage of Group.	Number.	Percentage of Group.						
3 to 7	M.	144	2	1·4	2	100·0	2	0	4	2·8	2	1·4
	F.	142	6	3·5	6	100·0	2	0	8	5·6	6	3·5
8 to 10	M.	143	9	6·3	7	78·0	1	0	10	7·0	7	4·9
	F.	160	10	6·2	10	100·0	3	0	13	8·1	10	6·2
11 to 13	M.	283	32	11·3	30	94·0	4	0	36	12·7	30	10·6
	F.	337	27	8·0	18	67·0	5	1	32	9·5	19	5·6
14 to 16	M.	70	7	10·0	7	100·0	0	0	7	10·0	7	10·0
	F.	130	10	7·7	6	60·0	1	0	11	8·4	6	4·6
Total	M.	640	50	7·8	46	92·0	7	0	57	8·9	46	7·2
	F.	769	53	6·9	40	75·0	11	1	64	8·3	41	5·3
Grand total ..	..	1,409	103	7·3	86	83·5	18	1	121	8·6	87	6·2

Note.—Of 66 boys up to fifteen years of age and girls up to ten years of age who reacted to the Mantoux test at a 1/1,000 dilution, 62 (94%) reacted to the patch test. Of 37 girls over ten years of age who reacted to the Mantoux test at a dilution of 1/1,000, 24 (65%) reacted to the patch test.

infrequently a reaction showing an area of erythema without œdema was observed. This was treated as a negative result, but was recorded as "±". Comments on such results will be made later in the paper.

General Results.

The general results of the survey are analysed in Tables I and II. In Table I findings are presented in sex groups at yearly ages. In Table II the findings are assessed in four age groups. The number of children up to seven years of age who react to the Mantoux test is decidedly less than that of higher age groups. A statistical study of the data by Miss Helen Ferres, which forms an appendix to this paper, indicates that the increased number of positive reactors at and after ten years of age is statistically significant.

The percentage (8·6) of children in this survey who react to the Mantoux test is among the lowest recorded. Only one child classified as "Mantoux 1/1,000 negative, Mantoux 1/100 positive", gave a positive response to the patch test. This is an unusual finding. Ten children (five boys, five girls) who failed to react to the Mantoux test with 1/1,000 dilution after forty-eight hours, showed positive reactions three days later, and were classified as "Mantoux 1/1,000 positive". Five of these children (three boys, two girls) reacted to the patch test, and five failed to react to it. In other surveys these children would have been classified no doubt as "Mantoux 1/1,000 negative". The inclusion as positive of nine "±" Mantoux reactions with 1/100 dilution has increased the number of the non-reactions to the patch test, as all the nine children failed to react to the patch test. The relatively high proportion of girls over ten years of age who react to the Mantoux test with 1/1,000 dilution and fail to react to the patch test suggests the incursion of some new factor in regard to this group. A test of the homogeneity of the figures in Table I by Mr. E. A. Cornish indicates that this variation among them is almost great enough to be regarded as a non-random variation, the probability that they are chance values being just under one in ten. Colebatch found that children in an orthopædic hospital exposed to sun-bathing were relatively resistant to the patch test. The season of the present survey was midwinter, and very few children showed any signs of sun-tanning. It may be considered that older girls expose their arms more than the younger; but there are no grounds for the supposition that a significantly large number of girls suddenly adopt short-sleeved frocks at the age of ten years. A possible supposition is that some change in texture of the skin occurs about the age of puberty.

The control intracutaneous injections of diluent phenol saline solution occasionally produced a slight reaction of erythema without œdema. In two cases slight transient œdema was observed.

Sixteen teachers volunteered for testing during the course of the survey. Of six male teachers, two reacted to the Mantoux test with 1/1,000 dilution and also to the patch test; two failed to react to the Mantoux test with 1/1,000 dilution, reacted with a dilution of 1/100, and failed to react to the patch test. Of ten female teachers, four reacted to the Mantoux test with 1/1,000 dilution, two reacting to the patch test and two not reacting to it; none who failed to react to the Mantoux test with 1/1,000 dilution, reacted to the Mantoux test with 1/100 dilution.

Correlation of the Grades of Intensity of 87 Positive Mantoux and Patch Reactions.

The following tabulation sets out the observed correlation of grades of intensity of 87 Mantoux and patch reactions; this supports the validity of Volmer's classification of patch reactions in relation to Aronson's grading of Mantoux reactions:

Mantoux and patch reactions equal within one grade of intensity	81 cases
Mantoux reaction two or more grades more intense than patch reaction	4 cases
Patch reaction two or more grades more intense than Mantoux reaction	2 cases

Correlation of Results when Two Patches were Applied.

The results obtained when two patches were applied are given in Table III. In 41 cases both were positive,

TABLE III.
Correlation of Results when Two Patches were Applied.
(62 Cases.)

Type of Response.	Boys.	Girls.	Total.
Both patches—positive reactions equal within one grade of intensity	24	15	39
Both patches—positive reactions, that of first patch more intense than that of second patch	1	0	1
Both patches—positive reactions, that of second patch more intense than that of first patch..	1	0	1
First patch—positive reaction; second patch—no reaction	2	2	4
First patch—no reaction; second patch—positive reaction	1	6	7
Both patches—no reaction	1	9	10
Total	30	32	62

in 10 both were negative. If the 10 cases are discarded in which both patches gave negative results, there were 52 cases in which the child was proved to be capable of giving a positive patch reaction. Of the 104 patches applied to these children, 11 (10·6%) gave negative results. This indicates that the conditions of this survey involved a considerable experimental error in patch testing.

The factors involved were as follows:

1. The dates of reading of the patch reactions apparently favour the first patch reaction read on the fifth day, against the second patch reaction read on the third day after the application of the patch.

2. The first patches were applied to large numbers of children, averaging about 100, in one morning. Second patches were applied only to the few children showing positive reactions, and more individual attention was possible in applying this second patch. This factor favours the second patch.

The results indicate that the second factor was the more important, as the second patch gave the positive result in seven of eleven cases in which only one of the two patches gave a positive result.

The six girls who gave positive reactions to a second patch and not to the first were all over ten years of age. But for the application of a second patch the group of girls over ten years of age who reacted to the Mantoux test with 1/1,000 dilution and failed to react to the patch test would have been considerably greater.

Correlation between the Reactions of the Two Disks of each of 128 Positive Patches.

A "patch positive" result was recorded when one or both disks of the patch caused a reaction. Eighty-seven children reacted to at least one patch, and of these 41 (*vide* Table III) also reacted to a second patch. A total of 128 positive results was therefore recorded. The correlation of the reactions to the two disks of each of these 128 patches is set out in Table IV. This shows that 16 of the 256 disks (6·25%) gave negative results when the twin disk gave a positive reaction.

The chance of obtaining a negative patch disk result in a child capable of reacting positively should be at a practical minimum when one of the twin disks of each patch gives a positive result. This chance in the present survey proved to be 16 in 240, or 1 in 15. The consequent chance that two negative disk results may occur in one patch should be 1 in 15^2—that is, 1 in 225 (0·4%). From the data in Table IV, therefore, the minimal chance of failure of a patch to cause a positive reaction in a susceptible person should be 1 in 225. The results of the present survey set out in Table III compare unfavourably with this minimal expectation.

TABLE IV.

Correlation between the Two Reactions of Tuberculin-saturated Disks of Each of 128 Patches Producing Positive Results.

Type of Response.	First Patch.		Second Patch.		Total.		Total.
	Boys.	Girls.	Boys.	Girls.	Boys.	Girls.	
Both disks—positive reactions equal within one grade of intensity	40	26	25	17	65	43	108
Both disks—positive reactions, that of proximal disk more intense	0	2	0	2	0	4	4
Both disks—positive reactions, that of distal disk more intense	0	0	0	0	0	0	0
Proximal disk—positive reaction; distal disk—no reaction	1	5	1	0	2	5	7
Proximal disk—no reaction; distal disk—positive reaction	3	2	2	2	5	4	9
Total	44	35	28	21	72	56	128

Comments on Mantoux Reactions.

Delayed Readings.—It is frequently stated that Mantoux reactions should be read at forty-eight hours after the intracutaneous injections to avoid "false positive" results. This opinion is not confirmed by the experience of this survey, which is set out in the following comparison of reactions to the Mantoux test (with dilution 1/1,000) read on the second and fifth days:

1. Ten children, who did not react to the Mantoux test on the second day, reacted to the test on the fifth day.

2. Thirty children, who reacted to the Mantoux test on the second day, had more intense reactions by one or more degrees on the fifth day.

3. Sixty-three children presented equally intense reactions on both second and fifth days.

Reactions of Erythema without Œdema.—Small areas of erythema occurred not unusually around the sites of the Mantoux (1/1,000) and control injections. In 37 instances this reaction was more extensive in relation to the Mantoux injection than to the control injection at the forty-eight hour reading. As has been stated previously, these reactions were read as negative results, but recorded as "∓" reactions. All these children were given Mantoux tests with 1/100 dilution; the findings three days later were as follows: seven of the 37 children reacted to the Mantoux test with both 1/1,000 and 1/100 dilutions, ten reacted to the Mantoux test with a dilution of 1/100, and twenty failed to react to the Mantoux test with a dilution of 1/100. Four of the twenty children who failed to react to the Mantoux 1/100 injection showed much larger areas of erythema to the Mantoux 1/100 dilution than to the Mantoux 1/1,000 dilution. As 17 of the 37 children subsequently reacted to the Mantoux test, this erythematous reaction indicates that such a child is more likely to react positively to a higher concentration of tuberculin than are other children. Twenty-one additional children showed this reaction of erythema without œdema to the Mantoux 1/100 injection only. These children were recorded as "Mantoux 1/100 negative", and were not tested with more concentrated solutions of tuberculin.

Comments on Patch Reactions.

Immediately after removal of the patches, the disk areas were frequently observed to be coloured slightly yellow by the tuberculin. On subsequent days the disk areas frequently showed up as pale circular patches in a slightly reddened plaster area. On nine occasions the opposite state of affairs was noted, the skin previously covered by the tuberculin disks appearing darker than usual. Apparently the plaster blanched the skin slightly, while the disk retained the more normal colour of the skin, though in four cases the disk area appeared to be slightly reddened. In 22 cases the skin of the patch area under plaster and disks was reddened uniformly or in blotches. The skin of the inner side of the arm of some children exhibits scattered coarse or fine papules, which are apt to become reddened by the applied patch. This papular reaction was noted in twenty instances, in eight of which a reddened papule was in the area of one of the disks. A positive patch reaction of the grade "+" or more would never be confused with any of the reactions noted above, but in some cases a "±" patch reaction was closely simulated. The possibility of a positive "±" patch test result could not have been excluded from a few of such plaster reactions if a negative response to the Mantoux test with 1/100 dilution had not been available as a control.

Investigation of Families of Reactors to the Mantoux Test.

Miss J. MacLennan, the trained social worker on the staff, visited the families of the 121 children and eight teachers giving positive reactions to the Mantoux test. As many members of the families as could be persuaded to do so were examined at the Chest Clinic or at the health offices.

Families of 121 Children.

Of the families of the 121 children, 59 were found to have contact with pulmonary tuberculosis. Active pulmonary tuberculosis was discovered in the home of one family, 32 families had contact with proved tuberculosis in the home, fifteen families had contact with proved tuberculosis among relatives and eleven families had contact with proved tuberculosis among friends. Twenty-eight of these families had been investigated previously; seven were reinvestigated. Thirty-one of these families had not been investigated previously, sixteen were investigated, and fifteen refused to cooperate. Of the 23 families investigated, in thirteen all members were Mantoux tested, and in none of these did all other members of the family fail to react to the test. In 23 families investigated, 57 persons were examined. One person reacted to the Mantoux test, having active pulmonary tuberculosis; three persons reacted to the Mantoux test, having healed pulmonary lesions; thirty persons reacted to the Mantoux test, and were radiologically free from tuberculosis; nine persons failed to react to the Mantoux test and were not radiologically examined; fourteen persons were radiologically free from tuberculosis, and were not Mantoux tested.

The remaining 62 families had no known contact with tuberculosis. Thirty-eight of these families were investigated; in twenty all members were examined; in eighteen some members only were examined. Twenty-four families refused to cooperate. Of the 38 families investigated, in eighteen all members were Mantoux tested; in two of these all other members of the family failed to react to the Mantoux test. Of 38 families investigated, 97 persons were examined. Eight persons (of five families) reacted to the Mantoux test, having healed primary lesions. Thirty-two persons (of 21 families) reacted to the Mantoux test and were radiologically free from tuberculosis. Thirty persons failed to react to the Mantoux test and were not radiologically examined. Twenty-seven persons were radiologically free from tuberculosis and were not Mantoux tested.

Families of Eight Teachers.

Of the families of eight teachers, three had contact with tuberculosis within the home, four had contact with tuberculosis among friends, and one had no known contact with tuberculosis.

Of the 33 families in which pulmonary tuberculosis was known to have occurred in the home, in thirteen the patient was living at the time of the survey. Thirteen living known patients suffering from tuberculosis were therefore home contacts of the 1,409 children in the survey, a proportion of one to 108. In the city of Adelaide at the time of the survey 81 cases of pulmonary tuberculosis were known, and there are 7,774 homes in the city, a proportion of one to 96. The comparison of these figures is crude, but it gives slight support to the assumption that children tested represented a fair cross-section of the community.

X-RAY SURVEY OF THE SAME GROUP OF CHILDREN.

Subsequent to the skin testing campaign, the chests of 1,294 of the 1,409 children (592 boys and 702 girls) have been examined by X rays. Almost all were included in the groups of children coming from various schools for mass examination by the 35 millimetre miniature film method at the X-Ray Health Survey Clinic of the Adelaide Local Board of Health. A few of the positive reactors were radiologically examined at the Chest Clinic.

All of the 121 positive reactors have been radiologically examined; thirteen received reports of abnormality. Of the 1,288 who failed to react, 1,173 (535 boys and 638 girls) have been radiologically examined and seventeen of these have received reports of abnormality.

Of the 115 who failed to react to the skin test and who were not radiologically examined after the skin test, 27

TABLE V.

X-Ray Abnormalities in Children Reacting to the Mantoux Test.

Case Number.	Sex.	Age. (Years.).	Mantoux Reactions.	Patch Test Result.[1]	Report on Miniature X-Ray Film.	Chest Clinic Report.
I	M.	14	1/1,000+++	A++ B++	24.11.44: Shaded opacity of left middle zone.	15.12.44: Increased broncho-vascular markings. Possibly allergic sinusitis.
II	F.	14	1/1,000+++	A− B−	18.10.42: Small shadow of left base. 22.8.44: Possible calcification of hilum.	26.10.44: Possibly allergic sinusitis. Probably healed tuberculosis.
III	F.	14	1/1,000+	A− B−		29.7.44: Calcification of left hilum and base.
IV	M.	13	1/1,000++	1. A+ B++ 2. A++ B+	22.11.44: Prominent left hilum, increased markings at apices.	21.12.44: Increased lung markings. X-ray and clinical evidence of sinusitis.
V	F.	13	1/1,000++	A++ B+	21.11.42: Enlargement of left hilar shadow. 7.8.44: Left hilar shadow still increased. Small opacities in right lower zone. Possibly active tuberculosis.	August, 1944: (Dr. D. R. W. Cowan): Possibly active tuberculosis. December, 1944: No change. Probably quiescent.
VI	F.	13	1/1,000+	A++ B+	14.9.44: Possible healed primary focus of right perihilar region.	
VII	M.	12	1/1,000+++	1. A+ B+ 2. A+ B+	12.7.44: Calcification of left hilum.	
VIII	F.	12	1/100±	A− B−		2.9.44: Admitted to Kalyra Sanatorium with pleurisy and effusion. Mother active tuberculosis, in Royal Adelaide Hospital.
IX	M.	11	1/1,000+	A− B++	9.8.44: Small dense opacity of right base.	
X	F.	11	1/1,000++	A++ B+	13.10.42: Small focus in right middle zone toward periphery.	27.11.42: Positive Mantoux reaction. Calcification of right apex and middle zone. Soft opacity below right clavicle. 10.3.43: Soft opacity, round calcification has cleared. 14.8.43: Lesion contracting. 12.9.44: No sign of activity.
XI	F.	10	1/1,000++	1. A++ B+ 2. A+++ B++	13.7.44: Prominent perihilar markings.	
XII	F.	10	1/100±	A− B−	18.10.42: No abnormality detected. 14.9.44: Increased hilar shadows.	27.10.44: Mantoux test mildly positive reaction. Slight increase in lung markings. Enlarged left hilum. Clinical and X-ray evidence of sinusitis.
XIII	M.	8	1/1,000++	A++ B++	24.7.44: Healed primary focus of left middle zone and hilum.	9.10.44: Healed primary focus of left middle zone and hilum.

[1] A and B refer to the reactions of the upper and lower disks respectively of each patch. 1 and 2 refer to the reaction of two patches respectively when such were applied.

TABLE VI.

X-Ray Abnormalities in Children Failing to React to the Mantoux and Patch Tests.

Case Number.	Sex.	Age. (Years.)	Findings in Miniature X-Ray Film.	Chest Clinic Report.
XIV	M.	14	20.10.44: Increased inner basal markings.	—
XV	M.	14	18.11.44: Increased lung markings.	6.12.44: Mantoux reaction with vesication. Generalized increase of markings, especially towards apex. Possibly active pulmonary tuberculosis.
XVI	M.	13	10.10.44: Prominence of markings, particularly at bases.	—
XVII	M.	13	21.11.44: Calcification of right hilum. Increased markings at the bases.	11.12.44: No significant abnormality.
XVIII	F.	13	14.9.44: Increased pulmonary and hilar markings, especially on left side.	—
XIX	F.	13	25.10.44: Mitralized heart with prominent vascular markings.	—
XX	F.	13	25.10.44: Prominent left hilum. Possible tuberculous glands.	6.11.44: No significant abnormality. Review in twelve months.
XXI	F.	13	15.8.44: Past pleurisy.	—
XXII	M.	12	22.8.44: Prominent vascular markings below the right clavicle.	—
XXIII	F.	12	24.10.44: Prominent left hilum with mitralization of heart.	8.11.44: Miniature X-ray film appearances confirmed. No clinical abnormality detected.
XXIV	F.	12	23.10.44: Opacity of right costo-phrenic angle.	—
XXV	M.	11	13.7.44: Gross thickening of interlobar septum on right side. 29.7.44: Septum now showing only as a hair line.	—
XXVI	F.	11	14.9.44: Increased pulmonary and hilar markings.	26.10.44: Increased markings. X-ray and clinical evidence of sinusitis.
XXVII	F.	11	9.8.44: Scoliosis.	—
XXVIII	M.	10	10.8.44: Increased hilar shadows, possibly of tuberculous origin.	—
XXIX	F.	10	24.7.44: Heavy hilar and perihilar markings.	—
XXX	M.	7	11.12.44: Increased markings, right cardio-phrenic angle.	—

(seven boys and twenty girls) had previously been radiologically examined in 1942 or 1943. None received reports of abnormality.

Two girls, one reactor to the Mantoux test, one non-reactor, whose miniature X-ray films in 1943 had shown patches of increased density ("probably pneumonitis"), had no significant abnormality in 1944.

A précis of abnormality reports is given in Tables V and VI. Active tuberculosis supervened in two cases subsequent to skin testing. In Case VIII the patient gave a slight positive reaction to the Mantoux test with a dilution of 1/100 on July 3, 1944. She was admitted on September 2 to "Kalyra" Sanatorium with pleurisy and effusion. In Case XV the patient failed to react to the Mantoux test with a dilution of 1/100 (actually recorded "∓") on August 7, 1944. An X-ray abnormality was reported in his miniature X-ray film on November 18. He was then found to give a "++++" reaction to the Mantoux test with a dilution of 1/1,000, and his condition has been diagnosed as possibly active pulmonary tuberculosis.

On X-ray appearances alone the radiologists considered five patients (Cases I, V, XII, XX and XXVIII) to be possibly suffering from active tuberculosis. Statistics for the group, based on interpretation of miniature films only, therefore are as shown in Table VII.

TABLE VII.

Mantoux Test.	Number.	Total Abnormalities.	Possibly Active Tuberculosis.
Reactors	121	13 (10·7%)	3 (2·5%)
Non-reactors	1,173	17 (1·4%)	2 (0·2%)
Total	1,294	30 (2·3%)	5 (0·4%)

These figures can be compared with those of the general mass examinations carried out to date at the X-ray health survey. Of 70,000 attendances, 41,400 have been of children aged sixteen years or less. Miniature films of these children have shown 724 total abnormalities (1·7%), 113 (0·3%) arousing suspicion of active pulmonary tuberculosis.

Children with reported X-ray abnormalities are referred to their own doctor for further investigation. A certain number of these are eventually examined at the Chest Clinic. The Chest Clinic reports are made available by the courtesy of Dr. D. R. W. Cowan. These reports are reviewed by the medical committee of the X-ray health survey, both miniature and large X-ray films being viewed at the same time. These reviews demonstrated the reliability of the miniature films.

Of the 724 abnormalities reported among 41,400 children, 290 have been so reviewed. The following (Table VIII) are the final diagnoses in these 290 cases, in 75 of which the Mantoux test was found to produce a reaction.

The 724 abnormalities included 81 suspected spinal and heart abnormalities which are not proportionately represented in the Chest Clinic reports. Proportionately represented, these should amount to 32 instead of seven and the "no abnormality detected" group should be increased to 61. With these corrections, the lung abnormalities in the above list should represent those of a population of 18,600 children. This means that possibly active pulmonary tuberculosis has been discovered in 0·06%, probably healed pulmonary tuberculosis in 0·26%, and bronchial infections in 0·69%. Otherwise, of total abnormalities reported in children, approximately 1 in 30 have proved to be possibly active tuberculosis, 1 in 7 probably healed tuberculosis, 1 in 6 not significant, and 1 in 2·5 bronchial infection.

The proportion of X-ray abnormalities reported in the group of children who were skin tested is higher than in the general group of children. If the general average of final diagnoses should hold good, among the thirty abnormalities listed in the skin tested group of children there should be one case of possibly active tuberculosis, four cases of probably healed tuberculosis, five "not significant" abnormalities and twelve cases of bronchial infections. The anomalous supervention of two cases of acute tuberculosis during the course of the investigation has made the incidence of active tuberculosis unduly high in the group. If these are excluded, the proportions of diagnosed lesions are likely to be near the general average.

TABLE VIII.

Radiological Abnormality.	Number of Subjects.	Remarks.
Probably active pulmonary tuberculosis.	7	Boys, aged eight, twelve and fifteen years; girls, aged five, eight, nine and fifteen years.
Possibly active pulmonary tuberculosis.	4	Boys, aged six, eight, eleven and thirteen years.
Probably healed pulmonary tuberculosis.	48	Two failed to react to the Mantoux test.
Opacities which later cleared.	21	One reacted to the Mantoux test.
Past pleurisy ..	14	Five reacted to the Mantoux test.
Bronchial injections	128	92 with evidence of sinusitis, 22 being suspected of bronchiectasis; 10 reacted to the Mantoux test.
Miscellaneous ..	8	Two with right diaphragmatic hernia, colon anterior to liver in one case, posterior in the other; two with tumours; one with complete atelectasis of one lung; one with cystic disease; two with strongly marked *azygos sulci*.
Heart abnormalities	5	—
Spinal abnormalities.	2	—
Not yet diagnosed	5	—
No significant abnormality.	48	Two reacted to the Mantoux test.

Cases V, X and XV illustrate the possibility of detecting early tuberculous lesions with the miniature radiography technique. On the other hand, the girl ten years of age, whose positive response to the Mantoux and patch tests led to the diagnosis of active pulmonary tuberculosis in her mother, showed no X-ray abnormality. The outstanding success of the mass X-ray survey in children is the detection of bronchial affections which are mostly associated with sinusitis. The majority of these children fail to react to the Mantoux test.

SUMMARY.

1. One thousand four hundred and nine school children have been tested with intracutaneous Mantoux injections and tuberculin patches. Of these children 103 (7·3%) reacted to the Mantoux test with a dilution of 1/1,000, and 18 (1·3%) reacted to the Mantoux test with a dilution of 1/100, a total of 121 (8·6%). The percentage of positive reactors was higher in the higher age groups. Sex differences were variable. Of fifty boys of all ages and sixteen girls aged up to ten years who reacted to the Mantoux test with a dilution of 1/1,000, 62 (94%) also reacted to the patch test. Of 37 girls aged over ten years who reacted to the Mantoux test with a dilution of 1/1,000, 24 (65%) reacted to the patch test. Only one child of the eighteen who reacted to the Mantoux test with a dilution of 1/100 reacted to the patch test.

2. Two patches were applied to 62 children who reacted to the Mantoux test with a dilution of 1/1,000. Both patches produced reactions in 41 instances, both failed to produce reactions in ten instances, and one patch produced

a reaction and one failed to produce a reaction in eleven instances.

3. Of 128 patches giving positive results, one of the twin disks produced a negative result in sixteen cases.

4. The correlation of intensities of reactions conformed to the accepted gradings of Mantoux and patch test reactions. Readings of the Mantoux test results on the fifth day were found to be more efficient than readings on the second day after the injection.

5. Of the children, 1,294 were examined in a mass X-ray survey. Films of 121 children who reacted to the Mantoux test revealed abnormalities in thirteen instances (10·7%); 17 (1·4%) of 1,173 children who failed to react to the Mantoux test received reports of abnormalities; the total number of children in the group whose films revealed abnormalities was 30 (2·3%).

6. One of the children who reacted to the Mantoux test was found to be suffering from pulmonary tuberculosis, probably quiescent. This child had been found to have an abnormality in a mass X-ray survey two years previously. Two children developed active tuberculosis within a few months of the skin survey. One of these children, whose skin test gave negative results at the time of the survey, was detected in the follow-up of an abnormality report in the subsequent mass X-ray survey. One child, who reacted slightly to the Mantoux test in the survey, was subsequently admitted to a sanatorium suffering from pleurisy with effusion.

7. These results are compared with those of 724 (1·7%) abnormalities reported in 41,400 children's attendances at the X-ray survey, 290 of the 724 abnormalities having been thoroughly investigated. In this series final diagnoses of reported abnormalities in children showed that 1 in 30 proved to be possibly active tuberculosis, and 1 in 2·5 non-tuberculous bronchial infection.

8. Families of the 121 children who reacted to the Mantoux test were investigated as far as possible. A parent of one of these children was discovered to be suffering from active pulmonary tuberculosis, previously unknown.

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I wish to express my thanks to the Adelaide Local Board of Health for giving permission for this paper to be published, to Dr. C. E. Fenner, State Director of Education, for his support, to the staff of the Health Department for their willing cooperation—especially to Miss Helen Rechner, who was responsible for carrying out the clerical work and for the practical organization of the survey—to the members of the Voluntary Aid Detachments for their valuable assistance, and to Mr. E. A. Cornish and Miss Helen Ferres for their help and advice in regard to statistics.

REFERENCE.

(1) J. H. Colebatch: "The Tuberculin Patch Test", THE MEDICAL JOURNAL OF AUSTRALIA, Volume II, 1941, page 640.

STATISTICAL APPENDIX.

(By HELEN M. FERRES, B.Sc., Waite Agricultural Research Institute, Adelaide.)

The data collected in the course of this work indicated that the patch test was less reliable than the Mantoux test, and that there was apparently an interaction between the age and the sex of the individual.

The data of Table I were expressed as percentages of positive results among the total observations made in each group. Age groups five and sixteen years were eliminated to preserve orthognality; in order to equalize the variances, the transformation $\sqrt{x+\frac{1}{2}}$ was employed.(1) An analysis of variance was then carried out with the transformed figures, and the results of this analysis are shown in the following table (Table IX):

TABLE IX.

Analysis of Variance: Percentage of Positive Results per Group Transformed to $\sqrt{x+\frac{1}{2}}$.

Variation Due to.	Degree Freed.	Sum Square.	Mean Square.	Ratio.
Age (A)	9	12·0421	1·3380	25·486[1]
Sex (S)	1	0·6275	0·6275	11·952[1]
Test (T) ..	1	0·4644	0·4644	8·846[1]
$A \times S$	9	6·2413	0·6935	13·209[1]
Remaining interactions	19	0·9978	0·0525	
Total ..	39	20·3731		

[1] Significant, $P = 0·01$.

The second order interaction is taken as an estimate of the residual variance. As the mean square for the first order interactions $A \times T$ and $T \times S$ does not differ significantly from that for $A \times T \times S$, the three terms can be combined giving an error term, calculated from 19° of freedom,(2) with a mean square of 0·0525. The ratios based on this value show that age, sex, test, and the interaction "age × sex" are all significant at the 1% level.

More positive results have been obtained by the use of the Mantoux test than by the patch test; boys have reacted to a greater extent than girls; and at ages from ten to fourteen years there appear to be more positive results than at ages of six to nine years, or at fifteen years. The value for fifteen years is less reliable than that for the other ages, as it is based on a smaller number of individuals.

Examination of the table of means for "age × sex" with a standard error of 0·162 (means of 2) shows that at six years there is no difference between boys and girls; from seven to nine years there are more positive results for boys, but at eleven, twelve, thirteen and fifteen years the position is reversed. At ten and fourteen years the differences are not quite significant.

References.

(1) M. S. Bartlett: "Square Root Transformation in Analysis of Variance", *Supplement to the Journal of the Royal Statistical Society*, Volume III, 1936, page 68.

(2) F. Yates: "Complex Experiments", *Supplement to the Journal of the Royal Statistical Society*, Volume II, 1935, page 181.

TABLE X.

Age × Sex. Percentage of Positive Results per Group Transformed to $\sqrt{x+\frac{1}{2}}$. *(Means of Two Observations.)*[1]

Sex.	Age (Years).										
	6	7	8	9	10	11	12	13	14	15	Mean.
Male	1·59	1·45	2·00	1·73	3·09	3·47	2·94	3·70	3·27	3·10	2·63
Female	1·59	2·33	2·55	2·57	2·66	2·95	2·16	2·88	2·81	1·34	2·38
Mean	1·59	1·89	2·27	2·15	2·87	3·21	2·55	3·28	3·04	2·22	2·51

[1] Standard error for means of four, 0·1146; standard error for means of two, 0·1620.

GESTATION PERIOD.

By DAVID HARVEY SUTTON,
Captain, Australian Army Medical Corps, Australian Imperial Force.

WHAT is the most reliable method of calculating the expected date of labour? One school advocates counting back three months or forward nine and then adding seven days to the date on which the last menstrual period began; another counts back three months similarly and adds twelve days. Some Australian figures appeared desirable, as we have no right to assume that the average gestation period of Australian women is necessarily identical with that of women in other countries. As a first step in this direction the average time was calculated from the first day of the last menstrual period to the end of the second stage of labour for all women delivered at King George V Memorial Hospital, Sydney, the following being rejected: (i) all doubtful dates of commencement of the last menstrual period and (ii) those gestation periods, as calculated above, which appeared to be greater than 313 days or less than 251 days. Some 300 cases were thus deducted from the total, which then came to 2,293. The series is admittedly small, but is large enough to give a significant result. The average period was 282·55 days (the 283rd day). To use this figure in practice one should count back three calendar months and add ten days to the date of the last menstrual period. To be more accurate (which is scarcely worth while with such an approximate method), one should proceed as outlined above, except that when the date after counting back three calendar months falls in April or September, add nine days; if the date falls in December or January, add eight days; if the date falls in February, add seven days. An addition of ten days for all months has the advantage that it is easy and quick, and also that many women, especially *primigravidæ*, become intensely alarmed with fears of post-maturity if pregnancy continues beyond the date their medical adviser has given them. It is thus better to approximate to the 283 days than the 282 days' intervals.

Other methods of calculating the expected date include palpating the height of the *fundus uteri*, and adding, say, twenty-one weeks to the date of quickening. These methods, however, are scarcely accurate even to the nearest month and are full of fallacies.

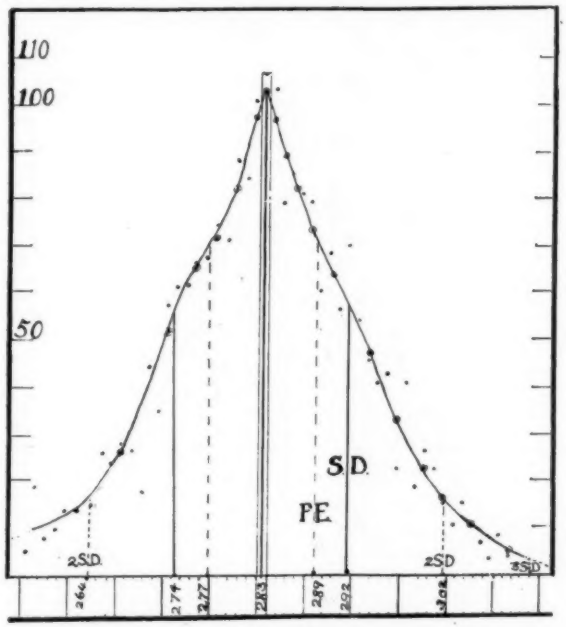

FIGURE I.

The odds against the expected day (Australia). The curve closely follows the normal curve. The mode, the day on which most babies were born, was the 283rd. Less than 5% were born that day or odds of more than 20 to 1 against. The mean or average length of gestation corresponds (282·55 days). The probable error (P.E.) ± 6·5 gives the "fifty-fifty" chance. Half the births therefore occur from the 277th to the 290th day inclusive. The standard deviation (S.D.) is ± 9·3 days. About 64% of the births took place between the 274th and the 292nd days inclusive—odds of "two to one on". Twice the standard deviation ± 18·6 gives a duration of 265 to 301 days inclusive—odds of nearly "ten to one on". Three times the standard deviation included all except about 1·5%, or odds of "67 to 1 on" for the period of the 255th to the 311th day inclusive.

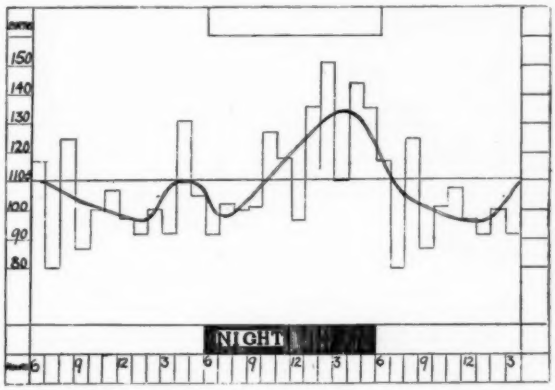

FIGURE II.

Hourly graph of births, night and day. One day and ten hours are shown. The base line equals sixty per hour. The line 110·5 per hour represents an equal distribution of births throughout the twenty-four hours. The highest figures are mainly from 11 p.m. to 6 a.m., with the maximum between 1 a.m. and 2 a.m. The lowest are at the meal hours.

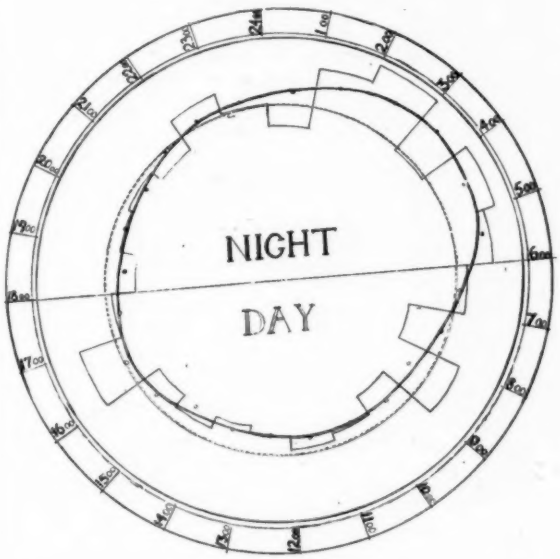

FIGURE III.

Radial graph of night and day births. The outer circles indicate Navy time. Midnight = 2400 hours; night time, 1800 (6 p.m.) to 600 hours (6 a.m.). The inner circle indicates equal numbers of births for every hour throughout the twenty-four. The cog-wheel graph indicates the actual number of births in the series. The circles and dots correspond to a smoothed graph, further smoothed by their being linked by a double outline looking like a human head viewed from above. A slightly greater number of births take place between 2200 hours (10 p.m.) and 700 hours (7 a.m.) and mostly between 100 and 600 hours—"the wee sma' hoors".

TABLE I.

Obstetrical Table for Australia.

January	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
October	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9
																								November						
February	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28			
November ..	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	1	2	3	4	5	6	7			
																								December						
March	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
December ..	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7
																										January					
April	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
January	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	
																										February					
May	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
February	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	1	2	3	4	5	6	7	8	9
																								March						
June	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
March	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	
																								April						
July	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
April	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	1	2	3	4	5	6	7	8	9
																								May						
August	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
May	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9
																								June						
September ..	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
June	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	1	2	3	4	5	6	7	8	9	
																								July						
October	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
July	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9
																								August						
November	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
August	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	
																								September						
December ..	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
September ..	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	1	2	3	4	5	6	7	8	9
																								October						

The best method (theoretically) is to find the date of the coitus after which conception occurred. This was first done on any scale during the American Civil War. It is obviously seldom determinable; but opportunity is relatively greater during war-time, now that many service units allow the husband only one day's leave in a month or similar period. Sydney Smith has calculated this interval at 272·6 days (boys) and 267·5 (girls); Matthews and Duncan estimate it at 275 days. If the average time for ovulation is taken as being fourteen days before the following menstrual period, and if conception is considered as occurring at about the same time as ovulation, this gives an average true gestation period for these Australian women of 269 days, which agrees fairly well with Sydney Smith's figures. Further estimations of the true gestation period would be interesting; but the best practicable method of finding a date to give the patient seems to be to go back three calendar months (or forward nine) and add ten days to the date of the last menstrual period. (Tables I and II and Figure I).

The "Small Hours".

There has long been a belief that more births occur in the small hours of the morning than at any other time in the twenty-four hours, thus taking the medical attendant from his well-earned sleep. A series of 2,654 consecutive births at the King George V Memorial Hospital, Sydney, confirmed this belief, but also showed that the difference between the number of births during the night and during the day was not very great: 1,446 births (54·5%) occurred between 9 p.m. and 9 a.m., and 1,208 (45·5%) between 9 a.m. and 9 p.m.—that is, 19% more births occurred during the former period. The peak hour was 2 to 3 a.m., and in each hour from 1 a.m. to 6 a.m. (with one exception) more births occurred than in any of the other twenty-four hours. An interesting point emerging was the relatively small number of births during the meal hours of the staff; this suggested either the hastening or the holding back of the second stage during the meal hours. However, the variation was not very great, and many births occurred at each hour of the day (Table III). The reason for the

TABLE II.

Duration of Gestation in Days, and Number of Babies Born Each Day.[1]

Day.	Births.	Day.	Births.	Day.	Births.	Day.	Births.	Day.	Births.
251	11	266	26	281	84	284	103	299	19
252	10	267	24	282	100	285	79	300	27
253	7	268	28	283	106	286	85	301	23
254	6	269	27			287	81	302	16
255	12	270	18			288	79	303	11
256	9	271	44			289	60	304	16
257	9	272	35			290	68	305	11
258	5	273	57			291	56	306	7
259	10	274	61			292	70	307	4
260	8	275	61			293	54	308	9
261	10	276	66			294	46	309	5
262	14	277	67			295	41	310	3
263	14	278	74			296	43	311	4
264	14	279	71			297	23	312	6
265	15	280	88			298	41	313	3

[1] Mode, 283; mean, 282·55; median, 282·5. Total number of births, 2,293.

TABLE III.

Hours of the Day and Night and Number of Births Each Hour, also "Smoothed" Numbers.

Night.	Navy Time. (Hours.)	Number of Births.	"Smoothed" Number of Births.	Day.	Navy Time. (Hours.)	Number of Births.	"Smoothed" Number of Births.
6–7 p.m.	1800–1900	92	97	6–7 a.m.	600	117	111
7 p.m.	1900	102	98	7 a.m.	700	80	107
8 p.m.	2000	100	101	8 a.m.	800	125	97
9 p.m.	2100	101	109	9 a.m.	900	87	104
10 p.m.	2200	127	115	10 a.m.	1000	101	98
11 p.m.	2300	118	114	11 a.m.	1100	107	101
12 midnight	2400	97	117	12 midday	1200	97	99
1 a.m.	100	136	128	1 p.m.	1300	93	97
2 a.m.	200	151	132	2 p.m.	1400	100	95
3 a.m.	300	110	135	3 p.m.	1500	93	108
4 a.m.	400	144	132	4 p.m.	1600	131	109
5–6 a.m.	500	136	130	5–6 p.m.	1700	105	109

predominance of the small hours is probably related, not to a popular belief that the birth occurs at the corresponding hour to that of the fruitful intercourse, but to variations in the bodily metabolism. The output of the endocrines—pituitary, thyreoid, ovary, placenta—and the autonomic nervous system with the related thalamus, the sphincter-relaxing parasympathetic, appear to gain predominance at night. The tendency, therefore, is to find that when mind and body are less preoccupied with other matters, such as nutrition, the general metabolism lessens and the activity of the uterus increases. The results are shown in graphic form (Figures II and III).

Bibliography.

S. Smith: "Forensic Medicine", Seventh Edition, page 326 *et sequentes.*

M. Duncan: "Fecundity, Fertility and Sterility", Second Edition, 1871.

Reports of Cases.

A RETROPERITONEAL OVARIAN DERMOID CYST.

By T. K. POTTS AND RICHARD FLYNN,
Sydney.

Clinical Record.

D.S., a female patient, aged thirty-seven years, sought medical advice from one of us (T.K.P.) because of the fact that though she had been married for ten and a half years, she had not been pregnant, and on account of pain in the right side of her abdomen. She had noticed the increasing size of her abdomen during the preceding nine months. Menstruation had commenced when she was thirteen years old and had been regular at intervals of twenty-eight days. Her menstrual period usually lasted four to five days, and she experienced only slight discomfort in the sacral region. Her last menstrual period had been two weeks previously. Her bowels were well opened daily and no other relevant facts were learnt from her pre-operative history.

On inspection, her abdomen was obviously unevenly enlarged and presented the appearance of multiple swellings extending upwards on the right side to the costal margin and to the left of the median line in the middle half of the abdomen. There was no movement of any part of the mass on respiration, but the abdominal wall appeared to ascend and descend over the mass during the respiratory act. The swellings on palpation were rigidly immobile, giving the impression of one complete tumour mass. Six separate bosses could be palpated; some felt hard like fibroid tumours, but others were cystic. Pelvic examination disclosed that a firm mass occupied the whole pelvis. The mass was firmly incarcerated in the pelvis, but attempts to dislodge it upwards caused no pain. It was not possible to identify the cervix or the body of the uterus apart from the mass. Rectal examination showed that the mass was narrowing the lumen of the rectum. A diagnosis of multiple uterine fibroid tumours was made.

On February 22, 1944, through a subumbilical median line incision, the abdomen was explored and a large irregular mass was demonstrated extending from the pelvis, which it entirely filled, to Morrison's pouch. It also extended across the median line into the left side of the abdomen. The whole mass was obviously retroperitoneal. The uterus had been displaced upwards by the mass, so that the cervix was above the level of the *symphysis pubis*. The consistency of the mass varied in the manner noted at the physical examination. The left ovary was enlarged to the size of a hen's egg; it was stony hard, and whitish in appearance, and it was quite free from the general mass. It was removed for microscopic examination. The right Fallopian tube and ovary were not visualized, nor could the appendix be identified. The mesentery of the small intestine and of the

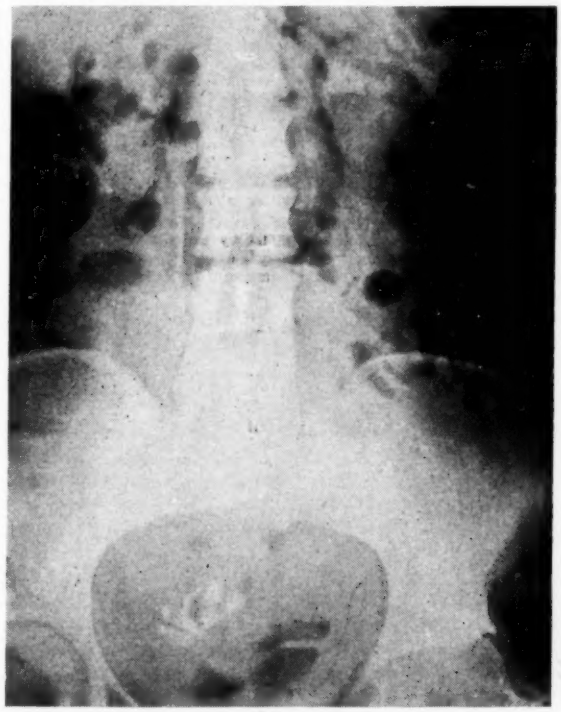

FIGURE I.

descending colon and caecum was stretched over the tumour. The upper portion of the mass prevented palpation of the right kidney. It was decided that any attempt at transperitoneal removal of the mass was impracticable, and the abdomen was therefore closed. Recovery was uneventful. The report of the pathologist on the left ovary was as follows: "The mass contains teeth and hair suggesting a diagnosis of dermoid cyst or teratoma."

After consultation we decided to seek the aid of the radiologist. A radiograph of the chest revealed that both lung fields appeared clear. There were no signs of

metastases. A plain X-ray film of the abdomen was taken, to see if there was any evidence of chronic small bowel obstruction. This film (Figure I) showed irregular opaque masses (i) in the right side of the pelvis, (ii) overlying the left sacro-iliac joint, (iii) overlying the

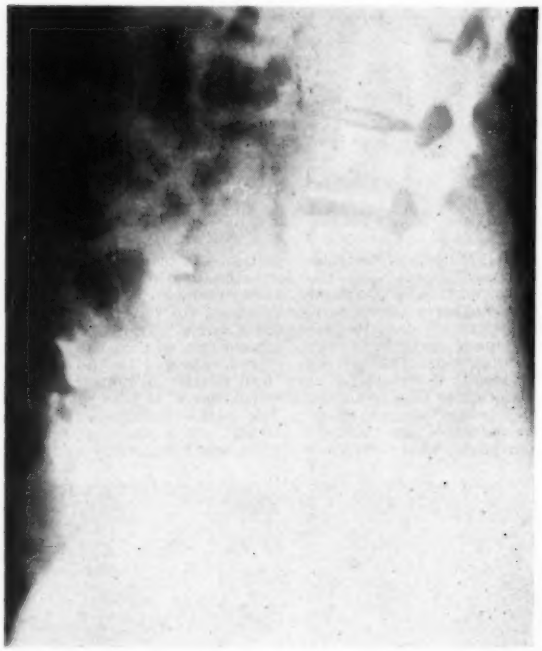

FIGURE II.

left half of the fifth lumbar vertebra, and (iv) at the level of fourth right lumbar transverse process. Two small, rounded, opaque areas were also seen in the left side of the abdomen in the line of the descending colon. The first,

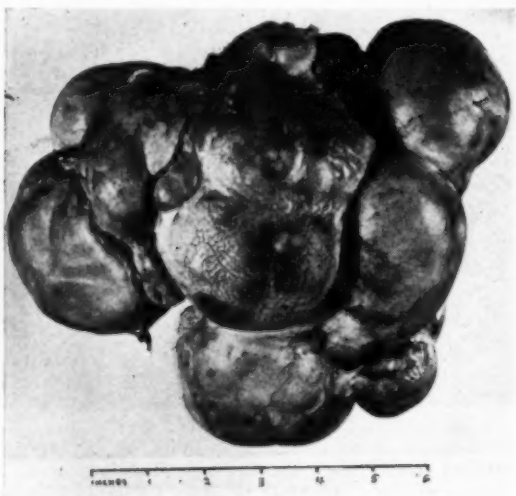

FIGURE III.

second and fourth masses appeared to contain teeth, and were therefore presumably dermoid cysts or teratomata. An excretion urogram was taken, and the antero-posterior film showed that both urinary tracts were normal. A lateral radiograph (Figure II) showed that the intestines were pushed anteriorly to the mass and the kidney and ureter were behind it. A barium enema was given, and the radiographer reported as follows on the film that was taken: "The enema flowed freely through the large bowel back to the caecum without any evidence of obstruction and the masses previously reported have no apparent relation to the colon itself. The caecum is somewhat higher than usual, but it is not enlarged. Appendix was not visualized."

It was now definite that the mass was a retroperitoneal ovarian dermoid, and it was decided to approach it through a long incision combining a Mayo lumbar kidney incision and Judd's incision for exposure of the lower third of the ureter. This proved an ideal approach, and a large retroperitoneal ovarian dermoid (Figure III) was removed without much difficulty. The peritoneum over the tumour in the pelvis was opened in the process, and this allowed us to see the appendix, which was also removed. The patient's convalescence was uneventful.

Conclusion.

Large retroperitoneal ovarian dermoids are comparatively infrequently met with, and that is our reason for publishing this case.

Acknowledgements.

We wish to thank Mr. Woodward Smith, of the New Medical School, University of Sydney, for the photograph of the dermoid (Figure III).

Reviews.

A YEAR BOOK OF INDUSTRIAL AND ORTHOPÆDIC SURGERY.

"THE 1944 YEAR BOOK OF INDUSTRIAL AND ORTHOPEDIC SURGERY" has been edited by Dr. Charles F. Painter.[1] It is divided into two parts—the first dealing with orthopædic surgery and the second with industrial medicine and surgery. The first part is much the larger, 322 of the 420 pages of the text being devoted to it. In the preface to the first part the editor states that many of the important contributions to the literature have dealt with reconstruction problems and with the experiences of surgeons in the military services. He points out that some of the new procedures have not had sufficient trial to permit a true evaluation of their efficiency to be made. In the non-military sphere arthritis, particularly in its chronic forms, has fallen into the domain of the orthopædic surgeon. Apart from the preface there are twelve sections in the first part of the book. These deal in turn with general considerations; fractures, dislocations and sprains; arthritis; osteomyelitis; miscellaneous inflammatory conditions; poliomyelitis; tumours and cysts; lesions of the shoulder and upper extremity, of the spine, of the legs, of the feet; and operative technique. The section on fractures, dislocations and sprains contains a timely reference to simplicity in fracture treatment—the reduction of fractures has become so complicated by many advocated gadgets that the tendency is to forget that all methods should be based on the fundamental principle of traction and countertraction *plus* manipulation. Every fracture differs from every other fracture and the method used must be suited to the individual case. The principles of the treatment of fractures associated with burns are discussed and fractures of the mandible are referred to at some length with suitable illustrations. In the section on lesions of the spine abnormalities of the intervertebral disks are discussed in several extensive references. These are important; two of them are by W. E. Dandy and one comes from J. G. Love and M. N. Walsh, of the Mayo Clinic. The editor does well to refer to the danger that the brilliant results following removal of the disk may cause operation to be undertaken oftener than is warranted. The sections in the second part of the book deal with general problems, infections, toxicology and miscellaneous specific hazards. The most important matters discussed are connected with rehabilitation of members of the fighting forces, but it is remarkable how few authors seem to cover the whole range of the subject. We must mention only to question the conclusions of three imaginative authors who discuss "menstrual exercises". Exercises do good in dysmenorrhœa, but these authors think that exercises lengthen ligaments which, being shortened by contracture because of menstruation, cause impingement of nerves on the ligaments. This mars an otherwise useful section of the book.

[1] "The 1944 Year Book of Industrial and Orthopædic Surgery", edited by Charles F. Painter, M.D.; 1944. Chicago: The Year Book Publishers. 7" x 4½", pp. 432, with many illustrations. Price: $3.00. Australian price: 23s. 6d.

The Medical Journal of Australia

SATURDAY, JUNE 16, 1945.

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THE RETIREMENT OF DR. J. H. L. CUMPSTON.

THE retirement of Dr. J. H. L. Cumpston, Director-General of Health of the Commonwealth, on June 18, 1945, may be looked on as marking the end of an epoch in the history of public health medicine in Australia. It is therefore fitting that we should review shortly the history of the Commonwealth Department of Health and pay a tribute to the work of the man who has made the department what it is today and has served the Commonwealth for thirty-four years with singular devotion and sincerity. Government departments are like many other institutions; they may in certain circumstances be dull and devoid of interest and run on the narrow lines of red tape without any cognizance of human beings as such. Although a Minister of the Crown is nominally in control, it is the departmental head who gives the department its character, inspires its officers and diffuses confidence among the members of the community. With a chief who has imagination as well as understanding and audacity, dulness and stagnation will never be known. When the Commonwealth was inaugurated by federation of the Australian States, there was no Ministry of Health, and therefore no Department of Health, and since that time a virile and effective department has been built up, in spite of difficulties often, of opposition from time to time and at one period of ministerial ideas which threatened to destroy a great deal of what had already been built. For this edifice Dr. Cumpston's constructive wisdom has been responsible.

Dr. Cumpston's association with the public health service of the Commonwealth began in 1911, when he joined the Commonwealth quarantine service; in 1913 he was appointed director of quarantine. The *Quarantine Act*, 1908, was the only means by which the Commonwealth was able to take any part in the control of public health in Australia. The provisions of the act name certain matters in respect of which the Commonwealth can enter into arrangements with State governments to aid in carrying out the act. Dr. Cumpston had not held office very long when an epidemic of smallpox occurred in New South Wales in 1913. Up till that time little if any joint action had been taken by Commonwealth and State medical officers in public health matters. Nothing but satisfaction can therefore be felt at the reflection that collaboration inaugurated by the Commonwealth at that time in regard to one epidemic has advanced to its present state when views are exchanged and plans for the common advancement of health are discussed at regular intervals. The next events which brought the Commonwealth prominently into the public health picture occurred in 1918 and 1921. In 1918 the influenza pandemic reached Australia and quarantine measures became of the utmost importance. As a matter of fact the publication of the reports of the Australian quarantine measures against influenza in 1919 attracted attention overseas. When the outbreak of plague took place in 1921 the Commonwealth Department of Health had been instituted. The department was brought into being in a way that may with advantage be recalled to the minds of medical practitioners. The history was set out in a leading article in this journal on February 12, 1921, in the following words:

> The story of the formation of the new department is bound up with the activities of the Rockefeller Foundation. Dr. Victor G. Heiser, Director for the East of the International Health Board of the Rockefeller Foundation, has recently visited these shores. He and his colleague, Dr. W. A. Sawyer, who is the Senior State Director of the same Board, and who is well known in connexion with the control of the Australian Hookworm Campaign, have held several conferences with the Prime Minister and other representatives of the Commonwealth. Dr. Heiser stated that his institute was desirous of further promoting its activities in Australia, and declared his intention of recommending to the institute that it place at the disposal of the Commonwealth the services of three investigators with special qualifications—one a specialist in industrial hygiene, the second a specialist in tropical hygiene, and the third a specialist in sanitary engineering. He made this offer contingent upon an agreement by the Federal Government to coordinate its health activities with those of his institute in Australia and to create a special Department of Public Health. At the same time, he suggested that the institute might later on lend to the Government an expert organizer of laboratories of preventive medicine. The Federal Ministry decided to accept the offer and to create a new department for the purpose of expanding the existing activities of the Federal Quarantine Service and of undertaking such other tasks as may be regarded as federal.

Up to the time of the foundation of the Department of Health, the Director of Quarantine had been an officer of the Department of Trade and Customs. In the *Commonwealth of Australia Gazette* of March 19, 1921, there appeared an announcement appointing Dr. J. H. L. Cumpston to the newly created position of "Director-General of Health and Director of Quarantine, Administrative Division, Department of Health, from 7th March, 1921". The functions of the Department of Health as stated at the time of its establishment are as follows:[1]

> The administration of the *Quarantine Act*;
> The investigation of causes of disease and death, the establishment and control of laboratories for this purpose;
> The control of the Commonwealth Serum Laboratories and the commercial distribution of the products manufactured in those laboratories;
> The methods of prevention of disease;
> The collection of sanitary data and the investigation of all factors affecting health in industries;
> The education of the public in matters of public health;
> The administration of any subsidy made by the Commonwealth with the object of assisting any effort made by any State Government or public authority directed towards the eradication, prevention or control of any disease;

[1] THE MEDICAL JOURNAL OF AUSTRALIA, November 20, 1926, page 679.

The conducting of campaigns of prevention of disease in which more than one State is interested;
The administrative control of the Australian Institute of Tropical Medicine;
The administrative control of infectious disease amongst discharged members of the Australian Imperial Forces;
Generally to inspire and coordinate public health measures;
Any other functions which may be assigned to it.

One of Dr. Cumpston's first cares on taking up his duties in the wider departmental sphere was to try to secure the cooperation of the practising members of the medical profession. In July, 1921, at the first meeting of the Federal Committee of the British Medical Association in Australia after his appointment, Dr. Cumpston, having written to the committee, was invited to attend its meeting. At the meeting he explained that it was the policy of the Federal Department of Health to keep in close touch with the medical profession as a whole. The only method of carrying this out was to constitute a formal association with the Federal Committee. It was wrong to attempt to administer public health laws without the collaboration of the medical profession. Dr. Cumpston then proceeded to explain to the members of the committee the work which his department proposed to undertake. The three special avenues of activity that he mentioned were those of tropical diseases, industrial hygiene, and the establishment of extra-metropolitan laboratories for clinical research. In discussing preventive medicine, he suggested that the several Branches of the Association should establish preventive medicine sections in the same way that the Victorian Branch had done. It is interesting to note that at this early stage in the life of the Commonwealth Department of Health Dr. W. T. Hayward, the chairman of the Federal Committee, suggested that the committee should refer to the Branches the question of the advisability of the taking over by the Federal Health Department of the complete control of public health from the States. Dr. H. S. Newland then asked whether Dr. Cumpston was prepared with any scheme for the unification of the public health administration. In reply, Dr. Cumpston merely pointed out that such a change would involve an alteration of the Australian constitution. In this connexion it is interesting to note that Sir Henry Gullett, writing in *The Herald* (Melbourne) on February 25, 1939, in discussing Dr. Cumpston, wrote: "If he aims at the unification of the Commonwealth, he has never said so. On the contrary he gives the impression of utter disinterestedness, aiming as a scientist at the prevention of disease and death from accidental causes, and the advancement of the health of the people." This is fine tribute from a prominent layman. Whether Dr. Cumpston has had a motto in the conduct of his department we do not know, but since man is judged by his works, we should suspect that it was: "First, for Australia." The policy all along the line, as far as outsiders can judge, has been the utilization of Australian scientific resources to promote the health and efficiency of the Australian nation. The Royal Commission on Health, whose report was published in full in this journal on January 16, 1926, made extensive recommendations. These cannot be enumerated in this place, but practically all of them have received attention at the hands of the Commonwealth Department of Health. The commission recommended the appointment of a Federal Health Council and of a Medical Research Council. The Federal Health Council met for some years and was the forerunner of the National Health and Medical Research Council. The Medical Research Council recommended by the commission has so far been part of the joint council. Those who have been following the discussions of the Federal Council of the British Medical Association in Australia will know that efforts are now being made to prevail upon the Federal Government to separate the health and the research activities of the National Health and Medical Research Council. The present point is that progress has been made along the lines laid down by the Royal Commission on Health and that this progress must be credited to the head of the Department of Health, its Director-General. Immediately before the financial depression the department was carrying on its activities in several divisions. There were the Divisions of Marine Hygiene, Tuberculosis, Venereal Disease, Epidemiology, Laboratories, Tropical Hygiene, Industrial Hygiene, Public Health Engineering, Veterinary Hygiene and Plant Quarantine. It was during the depression that the Government of the day tried for reasons of economy (so-called) to curtail in a very drastic fashion the activities of the Department of Health. The full details of the proposed curtailment were, as far as we know, not made public. But we do know that the Director-General resisted the proposals with every means in his power—he resisted in the interests of Australia and to prevent the dissipation of a staff of officers already trained to serve the country. Later on, when some of the "divisions" of the department disappeared and their heads had to be placed in other positions, Dr. Cumpston did not give way to discouragement and relax his endeavours as a lesser man might have done. He began once more to his lasting credit to reconstruct his department and to carry on his public labours.

Perhaps the best known and most appreciated of the achievements of Dr. Cumpston is the organization known as the Commonwealth Serum Laboratories. It is appreciated most of all at the present time by those who realize in what a parlous condition Australia would have been during this war period had the laboratories not been so ably planned and controlled and so well equipped. The Commonwealth Serum Laboratories are really an expansion of the Calf Lymph Depot, and their establishment was not effected without a fight in which prejudice and short-sightedness had to be overcome. The School of Public Health and Tropical Medicine at the University of Sydney is a body most useful to Australia at present and likely to be of much greater use in the years to come. There are those who have deplored the transfer of the work of the Tropical Institute from Townsville to Sydney, but as far as we are aware the full story has not been told, and in any case this is not the occasion for a discussion on that subject. The Sydney School of Public Health and Tropical Medicine has been and still is of great practical value to the Australian Army Medical Corps in its work on tropical diseases. Witness is borne to the truth of this statement by many of the communications from service medical officers published in this journal. There are many other activities of the Commonwealth Department of Health that might be mentioned—the work that culminated in the establishment of the Commonwealth X-Ray and Radium Laboratory, the cancer conferences that were held at Canberra, the research that has been carried out at the Institute of Anatomy, Canberra, the campaign for physical fitness, and so on. Clearly these cannot be discussed in

detail, but we must recognize that the driving force behind all these activities has come from the head of the department. Incidentally, we should recall that Dr. Cumpston has been associated with this journal on several occasions. He was chairman of the committee which was responsible for the special supplement on war medicine and surgery issued during the earlier war years. He contributed to the first issue of this journal on July 4, 1914, an article on the history of medical journalism in Australia; this was republished in our Silver Jubilee Number in 1939.

It is natural, having set out the main activities of the department which Dr. Cumpston has created, to inquire into the special qualities which have enabled him to envisage, plan and accomplish so much. A senior member of the profession who is in a position to know has pointed out that Dr. Cumpston has contrived in a unique way to combine width of vision with an unusual capacity for detail, and, moreover, that he is a man who can dream and not make dreams his master. Certainly he has been able to grasp opportunities, even as he was able to maintain his grip during the stormy episodes of the financial depression. Throughout his long service to the Commonwealth he has maintained the dignity of the profession and has insisted that medicine shall take its rightful place when others have held opposite views. The public servant often has a thankless task, but at the end of his term of service it may be claimed and should be declared that Dr. Cumpston, while meeting the needs of the present, has built on solid lines for the future and has earned the gratitude of the Australian people. Men such as he can say with Wordsworth:

> Enough, if something from our hands have power
> To live, and act, and serve the future hour.

Current Comment.

CARCINOMA OF THE GALL-BLADDER.

WHEN a radiologist reports to a physician specialist or to a general practitioner that he has found a pre-pyloric ulcer in the stomach of a patient referred to him for examination, the practitioner in question will at least consider the possibility that the ulcer is malignant and will not rest until he has dispelled any doubt that he may have on the subject. Moreover most practitioners treating a patient of the cancer age who is suffering from a gastric ulcer will keep in mind the great toll in human lives that is exacted by gastric cancer. It is not so with cancer of the gall-bladder. As pointed out in these columns on previous occasions, there is a curious tendency to look on the presence of gall-stones in the gall-bladder as something not very much to be feared, and in any case it is supposed that if they do cause trouble they can be removed without much difficulty—possibly the gall-bladder will have to be removed as well, but in these modern days such an operation is not particularly fraught with danger. Symptomless, or as they are often called, "silent", gall-stones are known to become more dangerous as age increases, and this was shown by Truesdell, whose work was discussed in these columns last year. Malignant disease of the gall-bladder is not a very rare condition, as reference to the literature will easily show. Moreover, the symptoms of gall-bladder disease may be present for a long period before the malignant change supervenes. When to this is added the fact that surgical operation is of little avail once malignant disease has become established, the lessons to be remembered are obvious.

A small series of cases of primary carcinoma of the gall-bladder has recently been reported by J. M. T. Finney and M. L. Johnson.[1] Of the eighteen patients in their series, two were males and sixteen were females. At the time the diagnosis was made one patient was aged between 40 and 49 years; three were between 50 and 59; six were between 60 and 69; seven were between 70 and 79 and one was in the next decade. The average age was 67·4 years. The presence of gall-stones was proved in eleven instances; in seven it was impossible on account of the extent of the growth to determine whether stones were present or not. In 13 cases there was a history at least suggestive of gall-stones for periods of from one to over twenty years preceding operation; in nine cases the history covered more than five years. It is important to note that in two instances the gall-bladder had been drained after removal of gall-stones, one twenty years and the other five years before the operation at which malignant disease was found. In only two cases among the eighteen was early carcinoma found, and both patients died of recurrences, in spite of removal of the gall-bladder. Most surgeons will agree with Finney and Johnson that cholelithiasis must be accepted as an ætiological factor in malignant disease of the gall-bladder. Their contention that early removal of calculous gall-bladders should be carried out, is justified and is in agreement with present-day surgical opinion. It is an opinion that should be shared by all clinicians.

POST-MORTEM EXAMINATIONS AT AMERICAN HOSPITALS.

THE American Medical Association has since the dawn of this century striven by the publication of surveys to improve the efficiency of United States hospitals. Since 1921 the surveys have covered all hospital facilities and have been issued annually by the association's Council on Medical Education and Hospitals. The advantages of such a system have been exemplified in the gradually increasing number of post-mortem examinations in hospitals.[2] In 1919 the schedule of "Internship Essentials" laid it down that autopsy facilities should be available and that interns should receive experience in post-mortem studies under the direction of the hospital pathologist. It was subsequently decided that after January 1, 1928, no hospital should be approved for intern training that had not a necropsy rate of at least 10%, the ratio to be raised to 15% a year later. In 1926 the number of hospitals reporting necropsy performance was 578. Of these 329 showed figures below 15%; 146 had a figure between 15% and 29%. In 1941, 727 hospitals reported; only 18 had less than 15% necropsies, 356 had between 15% and 29%; 43 had 70% and over. There has been a slight drop during the war years. If an attempt to "standardize" hospitals in this country resulted in a substantial increase in studies of post-mortem material, the effort would be worth while from that point of view alone.

A MEDICAL WAR HISTORIAN.

FROM Canberra comes the announcement that Colonel A. S. Walker has been appointed editor of the medical volumes of the official history of Australia's part in the present war. In this appointment he succeeds the late Major-General Rupert M. Downes. Colonel Walker is well known to the medical profession of the Commonwealth. His service in the present war has covered a wide field and from that point of view he is particularly well suited to undertake his new duties. At the same time he brings to the task unusual gifts of scholarship in medicine and literature. The Government is to be congratulated on the wisdom of its choice which augurs well for the success of the history. Colonel Walker has the confidence and good wishes of his colleagues and of everyone connected with THE MEDICAL JOURNAL OF AUSTRALIA.

[1] *Annals of Surgery*, April, 1945.
[2] *The Journal of the American Medical Association*, March 31, 1945.

Abstracts from Medical Literature.

PHYSIOLOGY.

Orthostatic Insufficiency by the Tiltboard Method.

S. C. ALLEN, C. L. TAYLOR AND V. E. HALL (*The American Journal of Physiology*, January, 1945) report that about 20% of 111 young healthy men fainted when tested on their tiltboard at 70° with hip suspension. About the same number fainted when standing quietly after running to exhaustion on a treadmill. The course of the heart rate, and of systolic and diastolic pressures of those who fainted and those who did not faint on the tiltboard, was not significantly different until about four minutes before collapse. The first sign of circulatory failure was a fall in systolic pressure, followed after a minute or so by decline in the diastolic pressure. Both fell precipitously in the last minute. In half of the cases the heart rate either did not change or rose; in the other half it showed a pronounced fall. Evidences of cerebral anæmia appeared about three minutes before collapse. No reliable sign was afforded by the circulatory data obtained during the resting state, after standard exercise, or on the tiltboard previous to the onset of collapse, which might have predicted fainting. Fainters could be identified only by carrying through the tiltboard test itself. While the average score in a maximal exercise tolerance test on a treadmill was lower for those who fainted, the difference was not significant. Accordingly, the ability to meet the stress of vigorous exercise and of prolonged quiet standing are two fairly distinct aspects of physical fitness. By means of an appropriate programme of physical training lasting several weeks, fainters may develop the ability to withstand gravitational stress. This has been demonstrated on identical twins, both fainters at the onset, one of whom served as a control. Evidently the physical training counteracted the orthostatic weakness in a somewhat specific manner.

Physiologically Equivalent Conditions of Air Temperature and Humidity.

S. ROBINSON, E. S. TURRELL AND S. D. GERKING (*The American Journal of Physiology*, January, 1945) report the results of over two hundred experiments of two to six hours' duration carried out in an air-conditioned room operated with dry bulb temperatures ranging from 23° to 50° C. in combination with various relative humidities. About one-half of the experiments were performed on men wearing shorts and others on men clad in army jungle uniforms. The physiological effect of the environment in each exposure was expressed as an "index of physiological effect", by weighting equally the elevation of the subject's heart rate, rectal temperature, skin temperature and rate of sweating from the base values of these functions determined in a cool environment on each subject in each activity. The effects of the environment on the men in relation to their activity and clothing are illustrated by six contour graphs in which their indexes of physiological effect are plotted in relation to dry bulb and wet bulb temperatures and relative humidity. Experiments were run to determine the most severe environmental conditions in which men could maintain thermal equilibrium after the second hour of six-hour exposures. The men walking in shorts maintained thermal equilibrium from the second through the sixth hours of exposures at 34° C. with 91% relative humidity and at 50° C. with 21% humidity when their metabolic rates were 188 Calories per square metre per hour. With metabolic rates of 130 Calories per square metre per hour they maintained equilibrium at 35° C. with 96% humidity and at 50° C. with 32% humidity. With resting metabolic rates of 46 Calories per square metre per hour the men in shorts could maintain equilibrium at 36° C. with 98% humidity and at 50° C. with 34% relative humidity. An air movement of 55 metres per minute prevailed during all experiments. The clothed men maintained thermal equilibrium at the respective metabolic rates only in environments distinctly less severe than those listed above for the men in shorts.

Influence of Dying Gasps, Yawns and Sighs on Blood Pressure and Blood Flow.

R. A. WOODBURY AND B. E. ABREU (*The American Journal of Physiology*, December, 1944) state that earlier studies have demonstrated interesting and important circulatory changes accompanying excessively prolonged or severe expiratory activities such as crying, coughing and straining. They report experiments made on dogs to demonstrate the circulatory changes produced by the more severe inspiratory acts such as dying gasps, and draw some conclusions regarding yawns and sighs. They demonstrated that normal inspiration increases venous return to the right side of the heart and produces changes characteristic of larger and more prolonged effective ejection without significantly changing the duration of systole. Dying gasps, deep breathing, yawns and sighs which are generally considered as respiratory acts, markedly increase venous return. In the presence of cardiac arrest, dying gasps pump blood through the lungs and temporarily provide blood flow to the vital areas, the central nervous system and heart. Effective net pressure as great as fifty millimetres of mercury in the pulmonary artery, fifty millimetres of mercury in the coronary arteries and forty millimetres of mercury in the central nervous system arteries were created by dying gasps in dogs when cardiac action had ceased.

Muscular Activity and Bubble Formation in Decompressed Animals.

D. M. WHITAKER *et alii* (*The Journal of General Physiology*, January, 1945) describe the experiments made on bubble formation under various conditions in bullfrogs subjected to decompression. Muscular activity during decompression causes bubble formation in the blood of intact bullfrogs. The amount of gas liberated depends on the degrees of muscular activity and supersaturation (as influenced by altitude). In decompressed dissected bullfrogs, bubbles appear in veins leading from active but not from inactive muscles. Muscular activity during decompression similarly causes bubble formation in rats. Bubbles appear in veins coming from muscles, and often in the lymphatic system. Quiescent rats do not form bubbles. Violent muscular activity before decompression favours bubble formation in bullfrogs during ensuing decompression, but it is less effective than exercise during decompression. The effect persists in large frogs for about an hour. Pre-oxygenation for two to four hours before decompression reduces the incidence of bubble formation in decompressed bullfrogs. It thus has the same effect on bubble formation in bullfrogs as it does on the "bends" in man. The effect is presumably due to removal of nitrogen. Possible mechanisms by which muscular activity causes bubble formation are discussed. The effects of mechanical agitation and of metabolic carbon dioxide are considered to be the dominant factors.

The Determination of Cerebral Blood Flow in Man by the Use of Nitrous Oxide in Low Concentration.

S. S. KETY AND C. F. SCHMIDT (*The American Journal of Physiology*, January, 1945) describe a method for the determination of total blood flow to the brain which they state is suitable for clinical application. The method may be used with an unanæsthetized patient and requires the arterial and internal jugular blood concentration of an inert gas such as nitrous oxide during the first ten minutes of its inhalation in low concentration. Certain necessary assumptions are experimentally tested and results of the method in monkeys are compared with those obtained simultaneously by direct measurement of cerebral blood flow. Sixteen determinations of cerebral blood flow on eleven human subjects by this method have thus far been made and suggest the feasibility of applying this method to clinical investigation.

The Oxygen Tension of Arterial Blood and Alveolar Air in Normal Human Subjects.

J. H. COMROE, JUNIOR, AND R. D. DRIPPS, JUNIOR (*The American Journal of Physiology*, December, 1944), review the values quoted in the literature for the normal oxygen tension of arterial blood in humans. The values given range from 63 to 103 millimetres of mercury. The authors discuss the reason for these variations and then describe their own results with the use of a direct method based upon the technique of Barcroft and Nagahashi. In thirteen normal young adults at rest in the semi-recumbent position, an average figure of 97·1 millimetres of mercury was obtained. Simultaneously collected alveolar air samples revealed an average oxygen partial pressure of 97·4 millimetres of mercury in end-expiratory samples. The authors state that there is no difference between alveolar and arterial oxygen pressure in healthy resting subjects at sea level.

BIOCHEMISTRY.

Pantothenic Acid.

B. LUSTIG *et alii* (*Archives of Biochemistry*, September, 1944) have studied the metabolism of pantothenic

acid and *p*-aminobenzoic acid. No storage or utilization of labelled N^{15} of *p*-aminobenzoic acid has been demonstrable. These findings corroborate the results of Strauss and co-workers obtained by colorimetric determination. Rapid excretion by animals depleted of pantothenic acid follows its parenteral administration. Its almost complete absence in various organs indicates that the nitrogen of pantothenic acid, unlike that of amino acids, is not utilized by the organism. No storage of pantothenic acid in mice can be assumed.

Liver Tumours.

THE influence of diet on the production of tumours of the liver by butter yellow has been investigated by E. L. Apic (*The Journal of Experimental Medicine*, September, 1944). The presence of fat in the diet accelerates the production of hepatic tumours by *p*-dimethylamine azobenzene (butter yellow). When the fat content of the diet is low, few tumours are produced. Butter yellow in a diet consisting in large part of rice, or in other types of diet with low protein content, causes nodular cirrhosis; but if rice is substituted for sugar in a diet containing protein, fat and butter yellow with an adequate vitamin content, it accelerates the production of tumours. Rice favours the production of hepatic tumours by agencies that are not yet explained. Butter yellow produces hepatic tumours in the absence of cirrhosis, but the frequency of tumours and of their precursors increases with the severity of cirrhosis.

Human Milk Fat.

T. P. HILDITCH AND M. L. MEARA (*The Biochemical Journal*, Volume XXXVIII, Number 5, 1944) have examined the component glycerides of human milk fat. These glycerides consist of about 24% of di-unsaturated glycerides in which the mono-saturated group is myristic, lauric or decanoic acid, about 19% of palmito-di-unsaturated glycerides, about 20% of glycerides containing one radical each of palmitic acid, unsaturated acid and one of the C_{10}, C_{12} or C_{14} acids, about 14% of mono-unsaturated-palmito-stearins, and minor proportions of various other mixed glycerides. The proportions of mono-palmito-glycerides and of glycerides containing one radical of either of the lower saturated acids have close resemblances to the proportions of the corresponding groups of glycerides in cow milk fats, and thus suggest that the origin of the short-chain glycerides may be the same in both fats. It is probable that the di-unsaturated and tri-unsaturated glycerides of human milk fat contain one radical of linoleic or other unsaturated acid, the remainder being oleic, and that the mono-unsaturated glycerides are almost wholly mono-oleo-glycerides. It is also possible that the source of milk-fat short-chain glycerides may be linoleo-glycerides, rather than oleo-glycerides as previously suggested.

Phospholipides.

H. D. FRIEDLANDER *et alii* (*The Journal of Biological Chemistry*, March, 1945) have studied the effect of choline on the renewal of plasma phospholipide phosphorus in dogs fed on a diet rich in fat and poor in protein. Radio-active phosphorus was the labelling agent. A single feeding of 300 milligrammes of choline chloride per kilogram of body weight accelerated phospholipide turnover in plasma. Choline increased the rate of change in the specific activity of phospholipide phosphorus of plasma during the early intervals after the administration of radio-active phosphorus. The maximum values found for the specific activity of plasma phospholipide phosphorus were higher in dogs given choline than in dogs given no choline.

Indoxyl.

A. O. M. STOPPANI (*The Journal of Biological Chemistry*, January, 1945) has studied in the dog the formation of indoxyl from possible precursors. Indole and to a very slight extent indole-aldehyde are the only indole compounds producing indole. Extra-hepatic oxidation of indole is equal to 30% of that observed in intact dogs. Among the *o*-amino-benzene derivatives studied only *o*-amino-phenyl-ethanol produced indoxyl. *o*-Nitro-phenyl-propiolic acid and *o*-nitro-phenyl-acetylene produce indoxyl in abdominally eviscerated dogs. *o*-Nitro-phenylacetylene can be considered an important intermediate in the transformation of indoxyl from *o*-nitro-phenylpropiolic acid. The presence of the liver is essential for the indoxylogenic action of *o*-nitrobenzoylacetic acid and *o*-amino-phenylethanol, *o*-nitro-acetophenone and *o*-nitro-phenyl-acetaldehyde.

Œstrogens.

L. LEVIN (*The Journal of Biological Chemistry*, January, 1945) has reported on the fæcal excretion of œstrogens. During the last two weeks of pregnancy, cows excrete 5,000 to 10,000 rat units of œstrogenic substance per kilogram of dry fæces. Calculated as α-œstradiol, this amounts to 0·9 to 1·4 milligrammes of œstradiol per kilogram of fæcal solids. The fact that the major proportion (73% to 96%) of the œstrogenic activity is found in the weakly phenolic, non-ketonic fraction of the extracts, strongly indicates that the active substance is œstradiol. Likewise, the ratio of the weight of the rat unit to that of the mouse unit is in good agreement with the similar ratio obtained with pure α-œstradiol, but not with that of œstrone or œstriol.

Nicotinic Acid.

D. W. WOOLLY (*The Journal of Biological Chemistry*, February, 1945) has reported on the production of nicotinic acid deficiency with 3-acetylpyridine, the ketone analogue of nicotinic acid amide. Typical signs of nicotinic acid deficiency as seen in susceptible species were caused by 3-acetyl-pyridine when two or more milligrammes per day were given to mice. This species was not susceptible to nicotinic acid deficiency produced by the usual dietary means. The signs of the disease were prevented by sufficient amounts of nicotinic acid or of nicotinic amide in the ration. The author regarded 3-acetyl-pyridine as the structural analogue of nicotinic acid in which the $-COOH$ group of the vitamin had been exchanged for $-COCH_3$. In contrast to the results with animals, 3-acetyl-pyridine was relatively ineffective for the inhibition of growth of microbial species, and in those instances in which inhibition of growth was produced it was not reversed specifically by nicotinic acid. This ineffectiveness against bacteria was not due to the ability of these organisms to inactivate the compound.

L. J. TEPLY *et alii* (*Archives of Biochemistry*, January, 1945) have investigated the nicotinic acid content of coffee. Roasted coffee was found to contain about ten milligrammes of nicotinic acid per 100 grammes. Restaurant coffee contained about one milligramme per cup containing 175 millilitres. In contrast to roasted coffee, a water extract of green coffee contains considerable amounts of nicotinic acid derivatives, which are activated for *Lactobacillus arabinosus* by treatment with moderately strong alkali. An attempt was made to measure the nicotinic acid activity of coffee for the chick, but the amounts of coffee extract given seemed to be toxic. When coffee extract or a norite eluate of coffee extract was given to black-tongue dogs receiving a diet poor in synthetic nicotinic acid, a biotin deficiency was apparently precipitated. The condition was characterized by lack of response to nicotinic acid administration and the development of an eye condition which responded to treatment with crystalline biotin. By inclusion of biotin in the basal diet, a satisfactory dog assay was obtained, and the results indicate that the material measured by *Lactobacillus arabinosus* is equally active for the dog. Dogs receiving 5% to 10% of finely ground roasted coffee in the diet developed a number of symptoms, including the eye condition mentioned above, and a paralysis involving all quarters, which responded to inositol administration. Addition of 5% to 10% of roasted coffee to the diet of rats produced poor growth with loss of hair in some cases. Caffeine also produced alopecia, but was not so potent as equivalent amounts of coffee in depressing growth. Decaffeinated coffee retarded growth, but did not produce alopecia.

Fatty Acids.

D. FAIRBAIRN (*The Journal of Biological Chemistry*, February, 1945) has studied the free fatty acids in animal tissues. When rat or cat liver is extirpated, a part of the constituent phospholipides is rapidly hydrolysed by intracellular phospholiposes. Within a few minutes, this hydrolysis in intact isolated liver tissues amounts to about 8%. If the liver is ground, hydrolysis increases to about 15%. When the ground tissue is suspended in buffer at pH 7·2, some 4% of its phospholipides are hydrolysed within four hours. Decreases in phospholipide phosphorus, choline and fatty acids closely parallel one another. There appears to be no preferential hydrolysis of particular fatty acids. The amounts of fatty acids which occur normally in tissues are very small, averaging 2·2 milligrammes per gramme of dry, fat-free mouse tissue, and 2·3% of the acetone-soluble lipides of cat liver. These values, owing to limitations of the experimental methods, may be regarded as maximum. Autolysis, even for short periods of time, greatly increases the amounts of free fatty acids in these tissues.

British Medical Association News.

SCIENTIFIC.

A MEETING of the New South Wales Branch of the British Medical Association was held at the Royal Alexandra Hospital for Children on April 17, 1945. The meeting took the form of a series of clinical demonstrations by the members of the honorary medical staff of the hospital.

Rheumatic Carditis.

DR. LAURENCE HUGHES first showed a female patient, aged twelve years, suffering from rheumatic carditis. The child had previously suffered from measles and whooping cough. She had not been well for two years, and had had pain in the legs for twelve months, the pain being located around both knee joints. She was breathless on exertion, and could not exercise like a healthy child; she tired easily.

On examination, she was a healthy looking girl. There was no joint involvement. The apex beat was felt three inches from the mid-sternal line in the fifth intercostal space. A harsh systolic murmur was heard at the apex. No other abnormality was detected. Dr. Hughes remarked that the condition was the "ambulatory" type of rheumatic cardiac disease.

Dr. Hughes next showed a male patient, aged ten years, who had been admitted to hospital on December 27, 1944. The child had been in hospital in the country for nine days, three weeks prior to his admission to the Royal Alexandra Hospital for Children. His legs were swollen and he had pain in the joints at the time. Since his admission to hospital he had been quiet and listless. His condition was worse for one week; he had gasping breathing and pain all over the chest, with a slight cough. He was treated with sulphapyridine for five days. The pain in the chest was gradually becoming worse.

On examination, the patient was seen to be a well-nourished boy; he looked ill. A slight increase in the respiratory rate was detected, and cyanosis of the lips was present. The area of cardiac dulness extended to the left axillary line and one inch to the right of the sternum. There was a triple rhythm with a pronounced friction rub at the mitral area, and a friction rub at all other areas. The lungs appeared clear. Tenderness was present over the hepatic and splenic areas. The liver and spleen were both palpable. There was no swelling or tenderness of the joints. The temperature was 100° F. The tonsils were large. An X-ray examination on December 27, 1944, showed the cardiac shadow to be much enlarged, especially to the left. This was thought to be due to a pericardial effusion. An attempt at culture from the blood was unsuccessful. Examination of a throat swabbing revealed hæmolytic streptococci. The blood sedimentation rate was 32 millimetres in the first hour and 55 millimetres in the second hour. A few days later dulness to percussion was detected over the lower lobe of the right lung posteriorly, with a few râles. The patient's rise in temperature gradually subsided, but his colour remained poor and he was given oxygen. At the end of another two weeks his general condition was gradually improving, though friction rub and murmur were still present. His lung condition also commenced to clear up. By January 25, 1945, his condition was greatly improved. The apex beat was in the fifth intercostal space, three and a half inches from the middle line, and only a systolic murmur was heard at the mitral area. X-ray examination showed the heart to be much reduced in size, and much less consolidation of the lung was observed. The blood sedimentation rate was reduced to 11 millimetres in the first hour and 24 millimetres in the second hour. On March 7 no cardiac murmur was audible, and the blood sedimentation rate was nine millimetres in the first hour and twenty millimetres in the second hour. The patient was gaining in weight and was very well; he was discharged from hospital on March 20.

Morquio's Disease.

Dr. Hughes's next patient was a female, aged three years, who had been admitted to hospital on March 6, 1945. The mother said that a deformity of the child's chest had been developing since she was aged twelve months, and also flat feet; she was unable to walk and also had some deformity of the back. The child's only previous illness was jaundice at the age of fourteen months.

On examination, the child was seen to be rather dull looking, with prominent frontal bones. The chest was pigeon-shaped. Prominence of the vertebral column at the lower end of the dorsal vertebræ and considerable *genu valgum* and *pes planus* were present. The child was of normal average height for her age, but was three pounds underweight; her height was 35·5 inches and her weight twenty-seven pounds. An X-ray examination of the long bones, ribs and vertebral column revealed changes in the spine, pelvis and hips, typical of Morquio's disease. The leg bones were also involved, but to a much less degree.

Hydatid Disease of the Lung.

Dr. Hughes next showed a male patient, aged eleven years, who had been admitted to hospital on November 29, 1944, with the history that he had had pneumonia two months previously and had not been well since. He had coughed up offensive sputum for ten days before his admission to hospital, and had been sweating and vomiting for two days; both these conditions improved after treatment with sulphathiazole. The child lived in the country, and his only previous illness had been measles.

On examination, the patient was seen to be a thin, pale boy, with offensive breath and some clubbing of the fingers. The chest, heart and abdomen were normal on examination. An X-ray examination of the chest on November 29 revealed large air-containing cystic structures in each lung, very large on the left side and smaller on the right side. The outline was clear cut; there was a double outline with air between the ectocyst and the endocyst. The condition was thought to be bilateral hydatid disease. A blood count gave the following information: the erythrocytes numbered 4,310,000 per cubic millimetre and the hæmoglobin value was 11·2 grammes *per centum*; the leucocytes numbered 9,200 per cubic millimetre, 53% being neutrophile cells, 34% lymphocytes and 2% eosinophile cells. No hooklets were seen on examination of the sputum. The Casoni test produced no direct reaction; the delayed reaction was "doubtful". The complement deviation test produced a strong incomplete positive reaction.

The child became pyrexial, and some doubtful signs developed in the chest; he was coughing up large amounts of pinkish, offensive sputum. A further X-ray examination of the chest on January 23, 1945, revealed that the condition on the left side was almost certainly hydatid disease, and that on the right side probably hydatid disease. On January 23 the child coughed up some material which was identified as of endocystic origin. He developed a cold, and it was decided to postpone operation till he recovered. Operation was performed on February 28. An incision was made just above the right nipple, extending out to the axilla; about three inches of the fourth rib were resected, the pleura was opened, and pus and endocyst were evacuated. A drainage tube was inserted, the end was brought out below the incision and the wound was closed. The tube was removed three days later and the sinus treated by the local application of penicillin.

By March 15 the wound had healed and the sinus was drying up. A large swelling with some crepitus was present just above the wound on coughing. Dr. Hughes said that the patient had been pyrexial again, and it was proposed at a later date to remove the hydatid cysts from the other lung.

Gaucher's Disease.

Dr. Hughes finally showed a female patient, aged eleven years, who had been admitted to hospital on March 7, 1945. The child had suffered from increasing pallor for six months and from frequent epistaxis; she was easily tired and had lost weight. No vomiting had occurred. The abdomen was increasing in size. There were eleven other children in the family. One sister had Gaucher's disease, and two brothers in the Australian Imperial Force had a history of hæmatemesis. The family was of Jewish ancestry.

On examination, the patient was a fairly well-nourished girl. Her colour was good. Pigmentation was present on the upper lip. Small purpuric spots were observed on the trunk; some had faded. The heart and chest were normal. The liver was palpable below the costal margin. The spleen was palpable three fingers' breadth below the costal margin. No other glandular enlargement was observed. A blood count gave the following information. The erythrocytes numbered 4,460,000 per cubic millimetre, the hæmoglobin value was 12·5 grammes *per centum*, the colour index was 0·95 and the corpuscular index was 88, the cells being normal in colour, size and shape. The leucocytes numbered 3,900 per cubic millimetre; 46% were neutrophile cells, 48% were lymphocytes, 1% were monocytes, 4% were eosinophile cells and 1% were basophile cells. Thrombocytes numbered 401,400 per cubic millimetre.

(*To be continued.*)

Correspondence.

SULPHATHIAZOLE FIRST-AID DRESSINGS.

SIR: Recently, when on leave, I called at the local kindergarten to take my twins home from school. Off they dashed down the bitumen path, and next minute there were loud wails as one of them took a fall. We washed the abrasions and the directress of the kindergarten produced from her first-aid kit a carton of proprietary sulphathiazole dressings. The recommendation on the carton is that a dressing should be used to protect every minor cut, blister and abrasion. There is no statement that the dressing actually contains sulphathiazole, but the implication is obvious.

Anyway, the dressing was applied and left *in situ* for two days. The generalized rash, pyrexia and vomiting that subsequently developed may have been coincidence, but they disappeared after the dressing had been removed.

By reason of the many cases of sensitivity that have occurred following the use of sulphonamides on skin lesions (to say nothing of the fact that such drugs come under the *Dangerous Drug Acts*) would seem to make it highly undesirable that such dressings should be sold to all and sundry without a doctor's prescription and in fact recommended by the makers for every "minor cut, blister or abrasion".

Yours, etc.,

H. S. PATTERSON,
Captain, Australian Army Medical Corps.

May 31, 1945.

DEAF AIDS.

SIR: In England and the United States of America I believe the Otological Society has a special committee who examine and report on the efficiency of each manufacturer's instrument and issue a certificate.

Here this is not the case, and the deaf who need aid are left to fend for themselves, more or less.

An audiogram is taken not by an ear specialist in a sound-proof room showing the loss of hearing for notes of definite vibrations. Testing for hearing spoken words by the audiometer is not done.

The instrument if sold is then taken away to be used under working conditions which are different from the testing conditions. There is no trial on approval.

It would appear to me, considering the large numbers of the deaf in the community, that their interests would be better served if these instruments, which, after all, are treatment, were directly under the supervision of the otologists as in England. For the poor their cost is prohibitive, and even for the middle classes little less so, especially if they have to be discarded as useless so often.

Yours, etc.,

INTERESTED.

May 31, 1945.

VENEREAL DISEASE?

SIR: Now that our countryside is beautified with hoardings testifying to the danger of venereal disease, I think that it is high time that reasonable consideration was given to the patient's approach to the disease. The very initials "V.D." conjure up in the lay mind something foul and loathsome, so that the patient's initial reaction is one of fear—fear of the disease and fear of the censure of his fellow men. In fact the thought on this disease has become so confused, even amongst the profession, that many of us view a syphilitic patient with distaste. After all, what is venereal disease? The dictionary defines it as one ordinarily contracted during sexual intercourse as its name would imply. Logically into this category come scabies, *pediculosis pubis* and particularly non-specific urethritis. Many a patient approaches the doctor with one or other of these diseases in the fear that he has contracted venereal disease. He is glibly informed that such is not the case. But why? The first two are highly contagious if benign and the latter is comparable in most aspects with gonorrhœa and often more difficult to cure. Why are two diseases so different in all respects except mode of transmission grouped under a common heading and loaded with opprobrium? The point I wish to labour is this: the opprobrium and consequently the incentive to hide venereal disease arises out of its mode of transmission and not from the disease *per se*. I do think that discarding the term "venereal disease" and using specific names would aid in banishing a patient's fear and ensuring that he report early for treatment. Further, to attach the opprobrium of venereal disease to a patient suffering from syphilis contracted through kissing, marital intercourse or attending syphilitics is at once unjust and slanderous. It casts a slur which is difficult to erase from his memory and even more from that of his associates.

If we are to bring venereal disease to light, let us bring it right out into the open and explain what the term means as a preliminary to discarding it, how the patient should view it, and why, hitherto, there has been a slur cast upon the unfortunate sufferer by many who must only be fortunate that they themselves are not infected. Let us not hide these highly infectious diseases under the shadow of an offensive term, but let us awaken the public to the fact that they are infectious diseases, nothing more, and let us inform them that the reason for the present campaign is to stamp out two more diseases as we are stamping out diphtheria, whooping cough and a whole host of scourges to the community.

Yours, etc.,

C. P. HARRISON.

Randwick,
New South Wales,
May 30, 1945.

PENICILLIN, THE COURSE OF INJECTIONS AND THEIR LOCATION, FROM THE POINT OF VIEW OF THE PATIENT.

SIR: The writer had occasion to have a million units of penicillin spread over a week administered recently for a chronic bronchial infection following a bronchopneumonia of several years ago. The effect upon the bronchial condition was definitely beneficial, but may not, of course, be permanent.

The main points upon which I want to touch are: (i) The repetition of the injections every three hours, day and night, irrespective of the patient's capacity to rest in between. (ii) The location of the injections as generally chosen for the drug. (iii) The manner of inserting the needle.

Number (i). Unless the infection which has to be combated is acute and the need is urgent, I feel that the continuance of three hourly injections is an undue strain on the patient's nervous system, and I would strongly recommend that one period of at least six hours be given without injections so that the patient may get uninterrupted sleep during that time. It is exasperating, after one has just got off to sleep, to be awakened by the sound of the trolly and the information that the next injection is due. After about the fourth day it requires a considerable amount of self-restraint to avoid telling the nurse to take herself and her trolly to the nether regions. I could not quite remember the right quotation which in reality is "Comes the blind fury with th' abhorrèd shears" (Milton—"Lycidas"), but I told the nurse that she and her two companions who shared the job of giving these injections round the clock, reminded me of the three Fates with "th' abhorrèd spears", but I am afraid the joke did not connect.

Number (ii). The localization of the point of injections. Penicillin is given intramuscularly, and as requiring such frequent repetition is handed over to nurses, and is controlled generally by physicians or surgeons, who have had little or no experience in intramuscular injections such as those of bismuth or mercury in the treatment of syphilis. The result is that the same fault which characterized the first intramuscular injections of other drugs thirty or forty years ago has been repeated. In the early days of intramuscular injections of mercury the thigh was selected, but was given up because the injections caused an undue amount of discomfort and lameness, and the final choice, which is agreed by the physicians of all nations all over the world, is the anterior part of the gluteal region. This area may be mapped out as that immediately behind the middle third or so of a line drawn perpendicularly from the tip of the great trochanter to the crest of the ilium. In this area there are few big blood vessels and few nerve trunks. If the injection is given further back, the deposit of bismuth or other medicament may be too near the sciatic or other nerve trunks, and cause a considerable amount of pain. If it is given in the upper third or upper half of the thigh, it can be easily seen that the femur is only one inch below the surface on the outer side of the thigh in this region. There-

fore, the needle has to be pushed somewhat obliquely to miss the femur. The thigh muscles being enclosed in very strong and stout sheet of fascia, distension by the injection causes much more pain and discomfort than in the anterior part of the buttock. I may as well admit that I insisted that my injections (56 in all) were given in what I regard as the only suitable situation, namely, the anterior part of the buttock. I had the whole of the injections on the right side because I normally sleep on my left side. The presence of the injected material caused me practically no discomfort at all, and I was able to get out of bed and walk about a little during the daytime without any difficulty or pain.

Number (iii). The manner of inserting the needle. I found it quite impossible to persuade the nurses who were giving the injections to drive in the needle with a quick hard stab. If done this way practically no sensation is occasioned, but if the needle is pushed in gently it causes much more discomfort and sometimes even pain if the needle is blunt. In the injection of bismuth and other substances, the technique which is generally followed is to push the needle in sharply and forcibly to the butt. Then, making sure that the point of the needle is not in a vein, as would be shown by blood welling out at the base of the needle, the syringe is fitted and the injection is made slowly. Unless the patient is very fat, a two inch or two and a quarter inch needle is quite long enough, and the calibre need not be as coarse as is required when injecting oily suspensions, such as bismuth and mercury.

Perhaps the most disagreeable thing about the injection was the use of ether to clean the skin before the needle was inserted. The feeling produced by the ether is really most disagreeable, and I cannot see why spirit should not be quite as effective, and it certainly is much more comfortable.

In conclusion, therefore, I suggest that the patient be allowed one period of six hours without interruption, say from midnight till 6 a.m. for rest purposes.

(ii) That the forty year old experience of the people who have been giving intramuscular injections all over the world should be accepted, and that the anterior part of the buttock, or perhaps as better described, the lateral aspect of the hip, be the site of injection.

(iii) That the nurse be taught to plunge the needle suddenly in, and to drive it to its butt in the one motion. Thereafter the syringe can be fitted to the needle butt, and the injection given.

Finally, that the patient should not be subjected to the extra discomfort of the very disagreeable cold feeling produced by using ether to clean the skin before injection.

Yours, etc.,

E. H. MOLESWORTH.

Beanbah,
235, Macquarie Street,
Sydney.
June 1, 1945.

THE DISPENSING OF THYREOID TABLETS.

SIR: The executive of this association would be grateful if you would draw the attention of your readers to the position in relation to the dispensing of thyreoid tablets, as there appears to be a widespread misunderstanding of this position.

When thyreoid tablets are prescribed without specification, pharmaceutical chemists are required by law operating in the various States to dispense *Tabs. Thyroidium* British Pharmacopœia, 1932, the current Pharmacopœia being the prevailing legal standard in all States.

A note in the Extra Pharmacopœia (Martindale) points out that the British Pharmacopœia, 1932, preparation of Thyroidium is five times as strong as the fresh gland preparation (British Pharmacopœia, 1914) and that untoward effects following the use of five-grain thyreoid tablets showed, on inquiry, that fresh gland was intended to be used.

Medical practitioners who intend that the fresh gland tablets should be dispensed should indicate this clearly by marking the prescription "B.P., 1914".

Yours, etc.,

F. C. KENT,
Honorary General Secretary,
Pharmaceutical Association of Australia and New Zealand.

354-364, Swanston Street,
Melbourne, C.1,
June 5, 1945.

AN APPEAL TO BORROWERS OF BOOKS.

SIR: My reason for writing this letter is to remind some of our old students that new students have come into their places and very much miss books which have been removed from the library in past years. We have recently remodelled the library and the students use it now to a very great extent, and many of the books which have been removed are irreplaceable.

It is therefore somewhat selfish on the part of people who took them—almost certainly with no intention of keeping them permanently—to retain them, and the post office does provide a very simple anonymous system of delivery of books.

Since 1936 we have lost 310 books and journals; some of the books would not be greatly missed, but others are now out of print and are valuable—such, for instance, as the Biography of Sir James Mackenzie, Haggard's "Devils, Drugs and Doctors". It is impossible to give the full list, but I would draw the attention of doctors to the need for keeping in the library full sets of the journals. Consequently, if they have odd numbers of journals, the set in the library is broken, and we have quite a number of odd volumes of journals missing.

But worse perhaps than any of the individual items in the books and journals is the loss of the Collected Works of Louis Pasteur in five parts. Another terrible loss is H. Boerhaave: "Academical Lectures on the Theory of Physic", 6 volumes, 1742-1746. I mention these two particularly so that if a collector proudly shows our editions to a medical man who is free from the collector's conscience, a line may be given on the present whereabouts of these two works.

Yours, etc.,

R. DOUGLAS WRIGHT,
Acting Dean of the Faculty of Medicine.

University of Melbourne,
Melbourne,
June 4, 1945.

Post-Graduate Work.

SPECIAL SERIES OF LECTURES AT SYDNEY.

THE New South Wales Post-Graduate Committee in Medicine announces that a special series of lectures will be held at the Stawell Hall, 145, Macquarie Street, Sydney, at 4.30 p.m. on Monday, July 2, 9, 16, 23 and 30 and August 6, 13 and 20, 1945. Particulars of the first lectures in the series are given below, while details of subsequent programmes will be announced later.

July 2.

"Backache and Sciatica": Orthopædic Aspects, Surgeon Commander Jackson Burrows, R.N.V.R.; Neurosurgical Aspects, Surgeon Captain Lambert Rogers, R.N.V.R.

July 9.

"Fractures", Surgeon Lieutenant Commander Vaughan Jackson, R.N.V.R.

"Infections of the Hand", Surgeon Captain A. W. Kendall, R.N.V.R.

The fee for attendance at the series, which is open to all civilian medical practitioners and service medical officers, is £2 2s., and applications, together with this amount, should be forwarded as soon as possible to the Secretary of the Post-Graduate Committee, 131, Macquarie Street, Sydney (telephone: B 4606), from whom full details of these lectures and other activities of the committee are available.

Obituary.

ARTHUR CHARLES FREDERICK HALFORD.

WE are indebted to Dr. Harold Love for the following appreciation of the late Dr. Arthur Charles Frederick Halford.

Arthur Charles Frederick Halford was born on November 23, 1869, at Collins Street East, Melbourne. His father, George Briton Halford, was then professor of Physiology

and anatomy in the new Medical School at the University of Melbourne. One of a large family, his boyhood was spent between Hawthorn in the city of Melbourne, Beaconsfield in Gippsland, and as a boarder at All Saints Grammar School, East St. Kilda. Going on to the university, he studied first science, and particularly physiology under his father, and later completed his medical course, graduating as Bachelor of Medicine in November, 1894, and Bachelor of Surgery in March of the following year. After a short period as resident medical officer at the Alfred Hospital in Melbourne, he joined the resident medical staff at the Brisbane General Hospital in 1895. In 1898 he returned to Melbourne, acted as assistant demonstrator in pathology for a short period and took his degree of Doctor of Medicine.

He then returned to Queensland, and until 1902 was medical superintendent of the Clermont Hospital. He was then appointed medical officer of health to the Combined Board in Brisbane, his duties including dealing with and

reporting upon an epidemic of bubonic plague. From this time onward he engaged in private practice in Brisbane. He died at Brisbane on January 13, 1945, survived by a son, a daughter and four grandchildren. His wife, who was Honora FitzGerald of County Cork, Ireland, predeceased him by some dozen years.

Although (or perhaps because) his academic training was based on pure science, physiology and medicine, it was as a surgeon and more especially as a gynæcologist that he spent most of the later years of active practice. A foundation Fellow of the Royal Australasian College of Surgeons, and an honorary and later consultant surgeon to the Lady Lamington Hospital for Women, he became deeply interested in the problem of the prevention of sepsis, particularly of puerperal and surgical wound sepsis. He advocated and practised a return to the strict Listerian technique dealing with all open or discharging wounds or body cavities, including the post-parturient uterus. Lister, he pointed out, could and did open cold abscesses in the complete certainty that they would never, as treated and dressed by him, become secondarily infected; nor would open compound fractures or empyema cavities similarly protected. The modern use of the aseptic dressing, Halford insisted, can do nothing but keep macroscopic dirt out of such wounds, and the onus is upon modern surgery to defend itself against a charge of neglect, in that it has abandoned the one scientific and bacteriologically sound method of preventing primary and secondary infection. He expressed his ideas in various articles, and in a small book, "Lister Redivivus", and in private discussion and correspondence. It seems obvious now that these ideas are coming into their own in surgical thought, and to that extent Halford, although he never claimed to do any more than revive the Listerian precision of technique, was, in one sense, ahead of his times.

His years of practice in Brisbane were full and varied. In addition to his private and hospital work, he acted as medical officer to the Metropolitan Water and Sewerage Board, to the Fire Brigades Board, to the Royal National Association and many others. He was always interested in and associated with the activities of the Australasian Trained Nurses Association. For a time he wrote regularly for the "G.P.". He was a member and ex-president of the British Medical Association.

His professional activities were, however, only part of the man himself. He was a happy man with that happiness which springs from love of one's fellow-men. His family, his patients, his "troops of friends" shared and instinctively returned the affection, the kindness, the gaiety and the consideration of others which he brought, spontaneously and inimitably, to the business of living. He wrote, during his latter years: "My mother spoilt me by never finding fault with me. Since then I have gone out into the world, practised my profession and got married. Manners and methods have altered since then, but I preferred my mother's way."

The science of medicine progresses inexorably, and the new and brilliant discovery of today is inevitably commonplace or superseded tomorrow. The practice of medicine and the doctor who cares for the sick, however, do not change. We are possibly in danger of forgetting that all the discoveries of medical science, whatever fame and profit they bring their discoverers and exploiters, are useless and even dangerous unless they are used and applied with skill, wisdom, honour and humanity. To the fact that it naturally attracts to its ranks at least a leavening of men with such qualifications, the profession and vocation (as opposed to the mere practice) of medicine owes its integrity, possibly its existence. This spirit, the spirit of Lister and of Osler, the spirit which demands as a matter of personal honour and compulsion that a patient shall be given all the care, time, skill, kindness and thought he needs, without regard to cost or reward, is the spirit which made Stevenson describe the doctor as "the flower, such as it is, of our civilization". In this spirit Arthur Halford practised medicine.

With his passing, certain links are severed with the early years of the Melbourne Medical School and with the early development of the medical profession in Brisbane. With other members of his family, he established and endowed the Halford Memorial Oration to be delivered annually at Canberra in memory of their father, to whom the early shaping of the medical school of Melbourne owes so much. To these we owe much authentic historical material, as well as matter of scientific value. At the same time much of the earlier medical history of Brisbane is being lost as one by one the eye-witnesses leave us. Halford, in an appreciation of the late Dr. E. Sandford Jackson, pointed this out and advocated the publishing of the material which Dr. Jackson had gathered before his death. There still remain a few who could implement and give authority to such a work—the collection and documentation might not now be difficult, whereas, in a very few years, who can tell?

A former colleague writes: Dr. Halford had no diploma in public health, but had always taken a keen interest in this subject, and while resident medical officer at the Brisbane General Hospital had been particularly interested in the transmission of typhoid fever by flies, and had made some experiments as to the possibility of typhoid bacilli multiplying when deposited on various foodstuffs.

Consequently it was not surprising that when the Metropolitan Joint Board for the Prevention of Epidemic Diseases was constituted to serve Brisbane and adjacent local authorities, he was appointed by the Board to be their medical officer of health; at the time of his appointment he was in private practice in Clermont.

At that time (1900) the epidemic disease causing most concern was plague, which had come to Brisbane the year before from Sydney, and Dr. Halford, who had assimilated Dr. Tidswell's views on the transmission of plague and had given much thought to plague and its problems, came to the position well qualified, as he had the true scientific spirit, a mind full of original ideas, plenty of courage and energy, and the faculty of getting on well with people.

The position was no pleasant one for several reasons. In dealing with cases notified to him as plague "suspects", he needed not only all his skill in diagnosis, but the tactful handling of friends and relations to whom the word "plague" was anathema, and who resented very strongly the removal

of the patient from his home to the plague hospital. Plenty of courage was needed, too, to investigate the source of infection, usually some produce store or grocer's shop where numerous dead rats would be found and where, no doubt, lots of infected fleas were ready to hop on any visitor.

To work under him was a delight, one received the fullest support, and, though full of original ideas himself, he welcomed them from others; looking back he seems to me to be one of the few doctors I have met whose outlook on various medical subjects was novel and stimulating.

ALAN PERCIVAL TENNY.

We regret to announce the death of Dr. Alan Percival Tenny, which occurred recently at Melbourne.

WILLIAM JOHN TREWHELLA.

We regret to announce the death of Dr. William John Trewhella, which occurred on June 2, 1945, at Melbourne.

EDWARD BULLER ALLAN.

We regret to announce the death of Dr. Edward Buller Allan, which occurred on May 30, 1945, at Melbourne.

The Royal Australasian College of Physicians.

ADMISSION OF MEMBERS.

The following candidates, who were successful at an examination for membership of the Royal Australasian College of Physicians held in Sydney and Melbourne in April-May, 1945, have been admitted to membership at recent meetings of the Council: Captain Murree Allen, Major L. V. Armati, Captain A. R. McGregor and Surgeon Lieutenant S. R. Reader, of New South Wales; Major D. G. Duffy, Captain F. Catarinich, Major W. L. Forsyth and Squadron Leader H. E. Williams, of Victoria.

Notice.

The Mental Hospitals Department of New South Wales, in conjunction with the Section of Neurology, Psychiatry and Neurosurgery of the New South Wales Branch of the British Medical Association, will hold a clinical meeting at 2.15 o'clock p.m. on Thursday, June 21, 1945, at the Mental Hospital, Rydalmere. Various types of mental deficiency, moral deficiency and epilepsy will be demonstrated. All members of the association are cordially invited to attend.

Nominations and Elections.

The undermentioned have applied for election as members of the New South Wales Branch of the British Medical Association:

Holley, William Chalfont, M.B., B.S., 1938 (Univ. Sydney), Squadron Leader W. C. Holley, 12, Lancaster Road, Rose Bay.

Silvester, George Raymond, Provisional Registration, 1945 (Univ. Sydney), Royal Prince Alfred Hospital, Camperdown.

Sinclair-Smith, Bruce Cooper, M.B., B.S., 1943 (Univ. Sydney), 13, Wentworth Avenue, Vaucluse.

Lofberg, Jack Valdemar, Provisional Registration, 1945 (Univ. Sydney), 30, Alleyn Street, Bexley.

The undermentioned has applied for election as a member of the Tasmanian Branch of the British Medical Association:

Zavetchanos, Stathy Anthony Marino, M.B., B.S., 1945 (Univ. Melbourne), General Hospital, Launceston, Tasmania.

Naval, Military and Air Force.

CASUALTIES.

According to the casualty list received on March 6, 1945, Captain A. J. King, A.A.M.C., Victoria Park, Western Australia, previously reported "prisoner of war", is now reported "not prisoner of war".

Diary for the Month.

JUNE 18.—Victorian Branch, B.M.A.: Hospital Subcommittee.
JUNE 18.—Victorian Branch, B.M.A.: Finance, House and Library Subcommittee.
JUNE 19.—Victorian Branch, B.M.A.: Organization Subcommittee.
JUNE 19.—New South Wales Branch, B.M.A.: Medical Politics Committee.
JUNE 20.—Western Australian Branch, B.M.A.: General Meeting.
JUNE 21.—South Australian Branch, B.M.A.: Council Meeting.
JUNE 21.—Victorian Branch, B.M.A.: Executive Meeting.
JUNE 21.—New South Wales Branch, B.M.A.: Clinical Meeting.
JUNE 22.—Queensland Branch, B.M.A.: Council Meeting.
JUNE 26.—New South Wales Branch, B.M.A.: Ethics Committee.
JUNE 27.—Victorian Branch, B.M.A.: Council Meeting.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

New South Wales Branch (Honorary Secretary, 135, Macquarie Street, Sydney): Australian Natives' Association; Ashfield and District United Friendly Societies' Dispensary; Balmain United Friendly Societies' Dispensary; Leichhardt and Petersham United Friendly Societies' Dispensary; Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney; North Sydney Friendly Societies' Dispensary Limited; People's Prudential Assurance Company Limited; Phœnix Mutual Provident Society.

Victorian Branch (Honorary Secretary, Medical Society Hall, East Melbourne): Associated Medical Services Limited; all Institutes or Medical Dispensaries; Australian Prudential Association, Proprietary, Limited; Federated Mutual Medical Benefit Society; Mutual National Provident Club; National Provident Association; Hospital or other appointments outside Victoria.

Queensland Branch (Honorary Secretary, B.M.A. House, 225, Wickham Terrace, Brisbane, B.17): Brisbane Associated Friendly Societies' Medical Institute; Bundaberg Medical Institute. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL or position outside Australia are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.

South Australian Branch (Honorary Secretary, 178, North Terrace, Adelaide): All Lodge appointments in South Australia; all Contract Practice appointments in South Australia.

Western Australian Branch (Honorary Secretary, 205, Saint George's Terrace, Perth): Wiluna Hospital; all Contract Practice appointments in Western Australia. All Public Health Department appointments.

Editorial Notices.

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All communications should be addressed to the Editor, THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales. (Telephones: MW 2651-2.)

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